



*Citation for published version:*

Harricharan, M, Wills, J, Metzger, N, de Looy, A & Barnett, J 2015, 'Dietitian perceptions of low-calorie sweeteners', *European Journal of Public Health*, vol. 25, no. 3, pp. 472-476.  
<https://doi.org/10.1093/eurpub/cku171>

*DOI:*

[10.1093/eurpub/cku171](https://doi.org/10.1093/eurpub/cku171)

*Publication date:*

2015

*Document Version*

Peer reviewed version

[Link to publication](#)

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## **Dietitian Perceptions of Low-Calorie Sweeteners**

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(2014) *European Journal of Public Health*

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Sources of Support: *This research was funded by the European Food Information Council (EUFIC), Brussels, Belgium*

Keywords: sweeteners, dietitian, perception, low calorie

Published article:

<http://eurpub.oxfordjournals.org/content/early/2014/10/24/eurpub.cku171>

## **Dietitian Perceptions of Low-Calorie Sweeteners**

### **Abstract**

*Background* Lowering energy (calorie) intake is essential in managing a healthy weight. One method of doing this is substituting sugar with low/no calorie sweeteners. The safety of sweeteners has been debated but little is known about how they are perceived by professionals responsible for weight management advice. We sought to explore dietitian perceptions of sweeteners and to identify the practical advice they provide about them.

*Methods* We collected data in France, Germany, Hungary, Portugal and the United Kingdom. We used face-to-face interviews and a novel online tool designed to engage people with online content in a way that approximates everyday processes of making sense of information.

*Results* We identified four approaches to sweeteners that dietitians took: (1) sweeteners should not be used, (2) they should be limited and used primarily as a transitional product, (3) sweetener use was decided by the client and (4) sweeteners should be recommended or at least allowed. Where dietitians are reticent to recommend sweeteners this is because they feel it is important for consumers to reduce their attachment to sweet tastes and of evidence linking the consumption of sweeteners to increased appetite. There is also uncertainty about the possible negative health effects of sweeteners.

*Conclusion* Dietitians' perceptions about sweeteners are uncertain, ambivalent and divergent, sometimes explicitly being linked to fears about adverse health effects. Clear and authoritative guidance is required on scientific evidence around sweeteners as well as the ways in which they can be used in dietetic practice.

**Keywords:** sweeteners, dietitian, perception, low calorie

## **I. Introduction**

Obesity and overweight are major risk factors for chronic diseases including Type 2 diabetes and cardiovascular diseases. In combination with physical activity, lowering the energy (calories) consumed from food and drink is essential in achieving and maintaining a healthy weight for some people.

One method of lowering energy intake is the substitution of sugar with low/no calorie sweeteners (hereafter referred to as 'sweeteners').<sup>1</sup> Bellisle and Drewnowski<sup>2</sup> compared the energy content of 15 sugar-reduced and regular foods and drinks finding that the energy content of all but two of the foods were lower with sweeteners.

Although EU food safety authorities state that sweeteners are safe, there continues to be contention around their safety and potential side effects,<sup>3, 4</sup> and little is known about the views of health professionals that are responsible for providing weight management advice. Accordingly, we aimed to explore dietitian perceptions of sweeteners and to identify the practical advice they provide about them.

### ***Research Landscape***

The literature suggests that the use of sweeteners alone does not impact weight loss.<sup>1, 2, 5</sup> However, for consumers who consume a significant amount of sweet foods, the use of sweeteners can support weight loss or weight maintenance as part of a calorie-controlled diet.<sup>2, 5</sup> However the discussion about the role sweeteners might play in weight management is dwarfed by the wider debate around the possible negative health effects of some sweeteners. Sweeteners are regulated in relation to an approved acceptable daily intake (ADI), set at a level well below the intake levels that have been seen to cause observable adverse effects in laboratory animals, up to 100 times lower.<sup>5-10</sup> As very

small amounts are required for a sweet taste, even among high users, intake is unlikely to exceed the recommended ADI.<sup>5, 9-11</sup>

Historically the messages about the safety, or otherwise, of sweeteners are received by health professionals and consumers and interpreted in this context. Both dietitians and consumers are active participants in the communication process and decision making and the availability of multiple sources of information may confuse rather than aid decision-making about using sweeteners.<sup>12</sup>

Little is known about public attitudes to sweeteners. One YouGov poll in the UK found that ‘many’ consumers were suspicious about them.<sup>3</sup> However, peer reviewed research that has sought to characterise public understandings of sweeteners is lacking. Media representations of sweeteners have been the subject of greater research attention,<sup>6, 13, 14</sup> but the media cannot be taken as a proxy for public views. Supporters of sweeteners argue that the media tends to report negatively on issues related to sweeteners.<sup>6</sup> Several studies would support this position.<sup>13, 14</sup>

Official statements from EU food safety agencies affirm that sweeteners are safe, however the debate continues.<sup>6, 9, 15, 16</sup> The US Academy of Nutrition and Dietetics has issued an official position statement,<sup>17</sup> including a guide to sweeteners approved for use in the US along with the supporting research. The Academy’s formal position is that

*“consumers can safely enjoy a range of nutritive and non-nutritive sweeteners when consumed within an eating plan that is guided by current federal nutrition recommendations, such as the Dietary Guidelines for Americans and the Dietary Reference Intakes, as well as individual health goals and personal preference” (p.739).*

The position statement acknowledges that dietitians have an important role in disseminating evidence-based information to the public and as such they require access to information from trusted sources. It goes on to clarify the regulations surrounding approved sweeteners in the United States, particularly the requirements for approving sweeteners and the safety processes sweeteners

have undergone as part of this. All approved sweeteners are described and assessed based on published research findings. Each sweetener is given a grade between I (Good) and III (Limited). This information, from a trusted source, gives dietitians confidence when providing education and guidance to patients.

In Europe, groups such as the British Dietetic Association, the Hungarian Dietetic Association and the British Diabetes Association<sup>18</sup> have produced informational booklets on sweeteners to inform their members and the public. These documents primarily summarise the approved sweeteners in the UK without taking a position on their use in diabetes or weight management.

Against this backdrop of scientific advice, debate and uncertainty, it is perhaps surprising that there is little research in the peer-reviewed literature addressing the question of how dietetic practitioners make sense of the science of sweeteners or how the views they hold are translated into dietetic advice. This paper therefore explores dietitian perspectives surrounding sweeteners. It characterises the ways dietitians in five countries perceive sweeteners, the rationale they provide for their views and the nature of the advice they provide to their clients about sweeteners.

## **II. Methods**

A qualitative study was conducted with registered dietitians in: France (FR), Germany (DE), Hungary (HU), Portugal (PG) and the United Kingdom (UK). Data were collected in the country language and translated into English for analysis. All the procedures used in this research were approved by Brunel University Research Ethics Committee.

Participants were recruited via an advertisement placed on the websites of the European Federation of the Associations of Dietitians (EFAD) and DIETS (European Thematic Network of dietetic associations, Higher Education Institutions and NGOs). Participants were drawn from a range of regions within each country and had varying amounts of dietetic experience: Eight

experienced/specialist weight-management dietitians ( $\geq 5$  years' experience) and 7 recently-qualified dietitians ( $< 5$  years' experience) were recruited from each of the 5 target countries. An equal distribution of hospital-based, community-based and freelance dietitians was sought in each country. There were two phases of the research: half of the recruited dietitians took part in phase 1 ( $n=75$ ) while the remainder were allocated to Phase 2 ( $n=76$ ). The aim was to seek a broad sample of dietitians providing a range of diverse views. Each phase involved different dietitians.

### **Phase 1: Face-to-Face Interviews**

We conducted face-to-face, semi-structured interviews with 15 dietitians in each of the five research countries ( $n=75$ ) to understand dietitians' perceptions of the role of low calorie sweeteners in weight loss. The interviews in FR, DE, HU and PG were conducted by dietitians linked to the project and in the UK by the project researcher (MH). All interviewers received training to ensure a consistent approach was taken. Each interview was audio-recorded, transcribed and translated into English for analysis.

In this phase, we first sought dietitian views around swapping sweeteners as an alternative to sugar. This was done in the context of swapping both fats and sugars for energy balance. Late in the interview, we focused specifically on their views about diet soft drinks as a product that can help lower calorie intake.

### **Phase 2: Online Qualitative Study**

The aim of the second phase was to supplement the decontextualized, 'in principle', reflections of the face-to-face interviews in Phase 1 by (a) enabling views to be provided anonymously and (b) by inviting consideration of practical issues where advice about sweeteners might be required.

Seventy-six practicing dietitians took part in phase 2. There were 15 from each of DE, FR and HU, 13 from PG and 18 from the UK. Their views were provided using the Vizzata™ tool. The use of this tool enabled us to present short informational vignettes to dietitians to elicit participants' questions and comments about their content.<sup>19</sup> One of the vignettes (gathered in a previous study) presented a summary of consumer views on sweeteners - positive, negative and uncertain. The full text of the vignette can be found as supplementary material to this paper.

Vizzata™ helped to elicit dietitian views in a less demanding environment – i.e. not in response to direct questioning, using consumer views as stimulus material and with the anonymity afforded by the online environment.

In this phase, unlike the interviews, we did not focus on soft drinks at any point. Sweeteners were identified generally, as 'no/low calorie sweeteners', without reference to particular products.

## **Analysis**

The data from both phases were analysed using thematic analysis.<sup>20</sup> Each phase was analysed separately. Patterns in the data within and across countries were identified and coded. Connections among emerging themes were made to develop the range and diversity of the themes. After all the data were coded, categories were analysed a second time for connections and areas of disparity. These processes allowed the researchers to view the data in terms of levels and dimensions of connected ideas and perspectives. The main analysis was conducted by MH and all codes and themes were finalised in discussion with JB. Where quotes are given to illustrate themes, codes are used to depict the country of the dietitian (France = FR, Germany = DE, Hungary = HU, Portugal = PG and the United Kingdom = UK). This is followed by the participant identification number.



### III. Results

The two phases presented us with different kinds of data. Phase 1 explored the advice dietitians give their clients about low/no calorie sweeteners and why. Phase 2 elicited views about sweeteners that were responses to stimulus material rather than direct questioning. This allowed us to acquire participants' reflections on sweeteners – contributing complex, more nuanced data.

#### Phase 1

In the interview data we identified four main approaches dietitians took regarding advice given about sweeteners:

- sweeteners should not be used [52 references to this from 37 dietitians]
- sweeteners were permissible only as a transitional product [48 references to this from 37 dietitians]
- client's informed preferences should determine sweetener use [6 references to this from 6 dietitians]
- sweeteners were allowed or recommended [13 references to this from 12 dietitians]

Box 1 below presents some dietitian views regarding sweeteners in line with these approaches.

The first theme was rejection of sweetener use (Box 1 A-G). In many cases this position took the form of a categorical rejection. The direct and definitive language used clearly depicted the strong views that many took. If patients were already using sweeteners, some dietitians admitted that they encouraged them to stop. Among UK dietitians there was much less evidence of strong anti-sweetener views than from dietitians in the four other countries.

INSERT BOX 1 HERE

The second theme in dietitians' responses showed a more moderate position about sweeteners (Box 1H-I). Here dietitians stated that they only allowed sweeteners on a limited basis – as a transitional or reward product, on a case by case basis. Such allowances were made if patients generally drink a lot of sugary beverages. In such circumstances swapping sugar for sweeteners was considered advisable or at least permissible in the short term, as a transition product. Within this model, sweeteners are meant to be used temporarily, and gradually cut down. It was possible for a dietitian to be very clearly negative about sweeteners and yet on occasion to recommend them to some clients as a transition product.

The third stance toward sweeteners, particularly evident in France, highlighted the perceived importance of choice (Box 1 J-K). These dietitians encouraged clients to make their own decisions about sweeteners based on the range of evidence that they shared with their clients.

The fourth approach to sweeteners that dietitians took was to allow or actively recommend sweeteners to their clients without qualification (Box 1L-N). This position was mainly taken by dietitians from the UK. Many of the responses within this theme acknowledged what they saw as contentious and negative press coverage about sweeteners but were explicit that they were not against sweeteners.

Dietitians who were fundamentally opposed to sweeteners often negotiated an alternative position in relation to the second and third response categories. Thus where the dietitian stated that he/she did not advocate sweeteners, it was sometimes the case that he/she did recommend sweeteners as a transition product to some clients or that he/she also provided clients with the information they needed to make their own choices. Both of these positions were in a sense a last resort: transition

products could be considered acceptable under extreme circumstances (e.g. extreme overweight or high sugar consumption) and the choice to use sweeteners was not one that the dietitian agreed with, although this position was not always shared with the patient. Those dietitians who were content to actively recommend sweeteners tended not to reference client choice. When they considered the role of sweeteners as a transition product, the focus was on these saving calories and being a means to the end of weaning clients off sweet tastes. In contrast to dietitians that generally rejected sweeteners, their use was not as a last resort.

### ***Reasons for not advocating or limiting sweeteners***

Many dietitians felt that it is important for consumers to reduce their attachment to sweetness. One dietitian referred to this as “a re-education of taste” (PG12). Dietitians felt that by combating patients’ craving for sweet tastes, weight loss could become more sustainable since patients would be less likely to go back to sweet foods.

The second rationale given for not recommending sweeteners was the citation of scientific evidence linking their consumption with increased appetite:

*“..because it tastes very sweet, it makes your body think it’s going to get sugar, and when it doesn’t get any from it, it thinks where’s the sugar stimulates the appetite, and you feel hungry” (UK11)*

Along the same lines others noted that sweeteners cause patients to “crave real sugary things more” (UK14).

Uncertainty about possible adverse health effects of sweeteners was also given as a reason why dietitians avoided recommending low calorie sweeteners:

*There are no studies that provide security, or at least to me... that their consumption does not cause a deleterious effect ... (PG12).*

They cited effects including asthma, cancer and premature birth. Others stated that they did not recommend sweeteners because they are not natural products. The approach these dietitians take in their practice is “in favour of everything that is natural” (PG10).

Lack of trust in industry also surfaced as a reason why dietitians do not recommend sweeteners. Dietitians felt that industry was more concerned about sales than helping the public. This was viewed as industries “wanting to almost sabotage you in your attempts” (UK11). This scepticism determined whether, and how, dietitians used tools and literature developed by industry for the public and health professionals in their practice.

## **Phase 2**

Phase 2 presented dietitians with a short vignette which contained a range of consumer views on sweeteners. Dietitians were then invited to submit feedback as questions or comments.

The analysis of this phase identified three main themes that were less clearly demarcated by country than in Phase 1:

1. There is a lack of reliable and consistent information sources on sweeteners
2. There is uncertainty surrounding sweeteners and how to use them in dietetic practice
3. Dietitians worry about the safety of sweeteners

The first and key theme in the responses relates to a perceived lack of availability of clear information about sweeteners. Although some saw their role as being, “to demystify the sweeteners’ effects and define recommendations” (PG406), many admitted that they are not always sure about how to respond to clients’ concerns.

There is a lot of information available on sweeteners and dietitians noted that it was difficult to distinguish between sources that are trustworthy and those that are not. This resulted in participants being unsure about how to handle sweeteners in the context of consultations. Dietitians felt that since they are information sources for the public, it was important for the profession to take a unified approach to sweeteners to avoid confusing patients. They felt that the provision of contradictory advice is unsupportive to patients and that having consistent messages coming from within the profession would enhance public trust.

The issue of the long term safety of sweeteners, as well as their value in weight management, were also raised by the dietitians. UK dietitians generally relied on the position taken by authorities, such as the UK Food Standards Agency and the European Food Safety Authority to guide their approach, even if they are unsure.

#### **IV. Discussion**

The intersection between the perceived 'unnatural' production of sweeteners, historically conflicting scientific findings about sweeteners, inconsistent regulatory positions internationally, conflicting public communication about sweeteners and the perceived association between politics and industry all influence dietitian perceptions of sweeteners. These conflicts result in uncertainty, disagreement, suspicion and fear, and even refusal to recommend sweeteners within weight management programmes among dietitians in the European countries we studied.

These interpretations were in turn linked to contrasting messages that circulate in the public domain about sweeteners, from different sources: government agencies, health professionals, scientific research and the media. These divergent perspectives influence dietitians' certainty. The impact of conflicting perspectives on trust and certainty has been well-documented.<sup>21-26</sup> Such uncertainty can result in confusion and public concern.<sup>27</sup>

To reflect on the methods used in this study, we found that dietitians were more willing to express insecurity and doubt during the on-line Vizzata™ study than in the face-to-face interview. We can speculate as to the reasons for this. Firstly, presentation of the vignette which consisted of material summarising consumer views seemed to enable dietitians to respond more openly about their perspectives than when asked direct questions; here dietitians did not need to have *an* answer, only comments or questions. Secondly, the content that dietitians were asked to respond to presented a mix of consumer views. Being faced with several perspectives may well have encouraged dietitians to articulate their uncertainties about sweeteners more fully.

As weight management experts and important sources of information, the dietitians we studied are in a precarious position. They receive divergent and conflicting messages about sweeteners which can induce uncertainty and suspicion. However, at the same time dietitians are called upon to confidently disseminate trustworthy information both to the public and to their clients. This ideally means taking a clear position, but in reality this may mean communicating their uncertainty. Research on communicating uncertainty has shown that in different circumstances this may increase<sup>28</sup> or decrease<sup>23</sup> public trust. Some dietitians feel able, or at least prefer, to communicate certainty to their patients, and to take a clear unambiguous approach to the issue. This can surface as a clear rejection or acceptance of sweeteners, or the limited use of them. In the UK, several dietitians we studied referred to the position taken by safety authorities, regardless of their own views.

It is important to note the strengths and weaknesses of this study. Including dietitians with a range of experience from different cultural backgrounds is an important strength of the study. It allowed us to capture a variety of views about sweeteners. The two methods we used, face-to-face interviews and an online study which enabled greater anonymity provided complementary perspectives. The logistics of conducting a cross-European study were challenging as there were 5 interviewers each conducting the interviews in their own language. We sought to ensure

consistency in their conduct through a training day. The interview schedule and Vizzata materials were all developed in English and translated into the relevant language for delivery. Results were first transcribed into the local language and then translated into English. The interviewers themselves conducted the transcription and translation for both the interviews and the Vizzata study. Clarification was sought by the analysis team where there were ambiguities.

In conclusion then, this study has identified and explored significant uncertainty surrounding sweeteners amongst dietitians. The ambiguous, uncertain and divergent positions that dietitians take seem to reflect the diversity evident within the media, public health information and NGO networks.<sup>3-6, 9, 13, 15</sup> The stance of many dietitians suggests that advice provided about the safety of sweeteners is often considered as being a function of industry involvement. It is therefore not considered as authoritative and consequently not appropriated in the advice that dietitians pass on to their clients.

In the United States, the Academy of Nutrition and Dietetics has issued an official statement on their position regarding sweeteners alongside guidelines to their members for addressing the issue in consultations.<sup>17</sup> Thus there is a clear position taken by a US expert body to guide dietetic practice in this area. There seems to be no equivalent guidance for dealing with the issue in professional dietetic contexts within Europe. Deriving and communicating a clear position with respect to the recent scientific evidence provided by EFSA<sup>29</sup> would arguably provide a key resource for dietitians in alleviating uncertainty.

## **Acknowledgements**

The authors would like to thank the European Federation of Associations of Dietitians (EFAD) for their role in recruiting the dietitians for interview and providing advice, in particular Judith Liddell and Kerry Yuill (EFAD secretariat). We would also like to thank the dietitians we collaborated with in the various countries, who interviewed, transcribed and translated all the interviews; Virginie Masdoua for France, Daniel Buchholz for Germany, Reka Kegyes for Hungary and Vera Ferro Lebres for Portugal. We also thank France Bellisle, Richard Shepherd and Pedro Teixeira for their advice throughout the project. This work was supported by funding provided by the European Food Information Council.

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### **Conflicts of Interest**

The European Food Information Council receives funding from companies in the European food and drinks industry.

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## Keypoints

- there is little research in the peer-reviewed literature addressing the question of how health professionals make sense of the contested science and media coverage around sweeteners
- perceptions of sweeteners are located within a contentious historical, political and scientific context
- this context creates uncertainty, ambivalence, disagreement, suspicion and fear about sweeteners and push back on their use by European dietitians we studied
- clear guidance on the research around sweeteners as well as the ways they can be used in dietetic practice is needed to alleviate dietitian uncertainty and increase public confidence in sweeteners

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