Food Research International 64 (2014) 456–464

Contents lists available at ScienceDirect

Food Research International

journal homepage: www.elsevier.com/locate/foodres

Consumer perceptions of satiating and meal replacement bars, built up from cues in packaging information, health claims and nutritional claims

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ARTICLE INFO

Article history:
Received 28 April 2014
Accepted 20 July 2014
Available online 28 July 2014

Keywords:
Consumers
Satiety
Meal replacement
Projective mapping
Health claims
Nutritional claims
Sensory

ABSTRACT

Previous research has shown that consumers' sensory and hedonic perceptions could be greatly influenced by the messages highlighted on the front of the packaging, particularly nutrition and health claims for reduced-calorie or functional foods. In food products designed for hunger control, mentioning satiating effects or meal replacement could potentially influence the expected satiety or other perceptions, including those associated with a filling effect. This study investigated the effect of packaging information on consumer perceptions of eleven commercial chocolate-flavoured satiating and meal replacement bars. Projective mapping (Napping®) with a descriptive step was used to profile the expectations elicited by the eleven bars, based on their extrinsic characteristics (without tasting them), with two different groups of consumers in two different scenarios: mapping the samples' packaging and mapping cards with an identical design showing the most important information displayed on the packaging (product name, nutrition information panel and nutrition and health messages or claims). The terms and comments obtained in the two scenarios were analysed and perceptual spaces were generated from the sample location and attributes obtained in the Napping® exercises, using multi factor analysis (MFA). The results showed that when evaluating the real packaging, the consumers mainly focused on the meal replacement- or satiation-related messages and on the images to build up their perception, attaching less or no importance to the nutritional information that was also displayed on the box. When examining the packaging, sensory expectations – which probably emerged from the images of the bars – were also a very important factor in placing the samples in the perceptual space. When looking only at the cards, the consumers' grouping and attribute generation focused in great detail on the nutritional information. The calorie content also became a much more important factor in their perceptions of the bars. Interestingly for the product category analysed, messages about "satiating" and "meal replacement" effects were clearly distinct and negatively correlated in the consumers' minds.

1. Introduction

In recent times, long working hours, changes in lifestyle and changes in family units have brought about changes in eating habits, often altering traditional meal times and the number of meals a day (Mestdag, 2005; Poulain, 2002) leading to fewer real meals being taken, while the number of informal, rapid snacks is increasing.

As a result, there has been enormous growth in the development of foods to eat in these situations, such as snack bars (sometimes claimed to be "satiating") or bars sold as meal replacements ("two bars replace a meal" or similar messages). Consumers find that the information on the packaging of these foods is very diverse and they probably do not fully comprehend it, both because of the variety of messages and because they lack the necessary knowledge. Some of them do not have enough time and want something they can eat quickly that will stop them from feeling hungry for a certain length of time, while others are overweight and think that eating a bar or two instead of a meal will help with weight control. However, hunger is not a single motivation but an interaction of several distinct mental and physical processes, and is therefore influenced by numerous external factors. A recent study highlighted specific potential benefits of satiating food. These include providing appetite control strategies for consumers in general and for those who are highly responsive to food cues; offering pleasure and satisfaction associated with low-energy/healthier versions of foods without feeling "deprived"; reducing dysphoric moods associated with hunger, especially during energy restriction; and improved compliance with healthy eating or weight-management efforts (Hetherington et al., 2013).

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http://dx.doi.org/10.1016/j.foodres.2014.07.028
0963-9969/

Because of this link between satiety and food intake, satiety is increasingly seen as a source of added value for the agribusiness industry, which has developed satiety-based weight-control products.

Formulating products to meet these changing calorie demands and consumer expectations of satiation and satiety (sensations of fullness within meals and between meals, respectively) is a complex process that will continue to be a focus of attention for scientists and food manufacturers (Fiszman & Varela, 2013).

The information shown on the packaging is known to have a considerable effect on the consumers' perception of the food (Becker, van Rompay, Schifferstein, & Galetzka, 2011; Schifferstein, Fenko, Desmet, Labbe, & Martin, 2013). The manufacturers use the packaging to provide information and to highlight certain aspects of the product's formulation and certain benefits associated with it (Carrillo, Varela, & Fiszman, 2012a). These messages can be verbal or non-verbal (colours, pictures, lettering size and type) (Carrillo, Varela, & Fiszman, 2012b). They can affect how the consumers perceive the product in different ways, giving rise to different expectations concerning its potential consumption. These expectations can be hedonic, related to sensory attributes, concerning quality, etc. It is quite common for the packaging of products such as snack bars to include statements concerning their satiating effects ("feel less hungry", "prolonged satiating effect", etc.) that could have a positive effect on appetite control by generating specific expectations (Brunstrom, 2011; Chambers & Swanson, 2012; Fay, Hinton, Rogers, & Brunstrom, 2011). Some studies have reported examples of these effects, such as heightening the satiating effect of

Table 1
Information provided on the sample packaging.

Sample	Denomination	Claims	Nutritional information[a]
A	Milk chocolate coated bar with magnesium and vitamin E	This cocoa-flavour bar bathed in milk chocolate makes an appetizing snack. Enriched with magnesium and vitamin E. The calories provided by the carbohydrate, protein and fat content respectively account for 40%, 30% and 30% of the total bar calories.	EV: 341; P: 26; CH: 33.7; SU: 22.4; TF: 11.3; SF: 5.8; γLA: 1; DF: 3.5; Na: 190; M: magnesium; and V: E.
B	Crunchy bar bathed in milk chocolate	Crunchy. 2 bars replace a meal. Meal replacement for weight control.	EV: 375; P: 24; CH: 45; SU: 27; PO: 12; TF: 12; SF: 6; DF: 5; Na: 300; M: calcium, phosphorus, iron, zinc, copper, iodine, selenium, magnesium, manganese, potassium; V: A, D, E, C, thiamine, riboflavin, niacin, B6, folic acid, B12, biotin, and pantothenic acid.
C	Meal replacement chocolate bars	2 bars replace 1 meal. With chitosan, fibre, 12 vitamins and minerals.	EV: 382; P: 26; CH: 38; TF: 12; DF: 9; Na: 212; M: potassium, calcium, magnesium, phosphorus, iron, zinc, copper, selenium, iodine, manganese; V: A, D, E, C, B1, B2, B12, niacin, folic acid, and pantothenic acid.
D	Cereals and black chocolate bar	The ingredients help you meet all your daily vitamin needs while controlling your calorie intake. 97 Kcal per bar. Ideal for taking care of your figure between meals. The low glycaemic index of these bars means that carbohydrates are absorbed more slowly and gradually, helping to dampen your appetite for longer. Feeling less hungry at mealtimes helps you keep your weight down. A treat that staves off hunger for longer between meals.	EV: 486; P: 6; CH: 58; SU: 38; TF: 24; SF: 14; DF: 7; Na: 200; V: A, D, E, B1, B2, B3, B6, B9-folic acid, B12, biotin, and pantothenic acid.
E	Meal replacement bars for weight control. Chocolate flavour	Meal replacement for weight control 1 bar = 1 meal. Helps regulate blood sugar levels. For a safe, effective and pleasant low-calorie diet.	EV: 290; P: 27.8; CH: 21.6; SU: 14.4; PO: 6; FR: 5.4; S: 6.5; L: 1.1; TF: 11.3; SF: 4.9; MUF: 3.9; PUF: 2.5; LA: 1.8; αLA: 10; DF: 18.4; Na: 253; M: calcium, phosphorus, potassium, iron, zinc, copper, iodine, selenium, magnesium, manganese; V: A, D3, E, C, B1, B2, niacin, B6, folic acid, B12, biotin, and pantothenic acid.
F	Milk chocolate bar with chocolate chips (6%)	Meal replacement bars. 2 bars = 1 meal. A safe, effective way to lose weight. Designed to provide all the necessary nutrients and a controlled calorie content for one complete, balanced meal. With protein-rich foods like these bars you feel fuller for longer, helping you to control your weight.	EV: 368; P: 25; CH: 44; SU: 29; PO: 14; TF: 12; SF: 6; DF: 3; Na: 300; M: calcium, phosphorus, iron, zinc, copper, iodine, selenium, magnesium, manganese, potassium; V: A, D, E, C, B1, B2, B3, B6, B9-folic acid, B12, biotin, and pantothenic acid.
G	Multivitamin bars bathed in black chocolate (74%)	Multivitamin biscuits. This product should not be used as a meal replacement in a balanced diet.	EV: 472; P: 6; CH: 58; SU: 38; TF: 24; SF: 14; DF: 7; Na: 200; V: A, D, E, B1, B2, B3, B6, B9, B12, biotin, and pantothenic acid.
H	Meal replacement for weight control	Control your weight easily, quickly and safely. 2 bars = 1 meal. New recipe, tastier and more effective. Only 151 Kcal per bar. With 12 vitamins and minerals. Rich in iron. This product complies with the Spanish and European regulations concerning low-calorie weight-loss diets.	EV: 378.4; P: 24; CH: 43.7; SU: 29; PO: 9; TF: 12; SF: 5.5; UF: 4.8; MUF: 3.2; PUF: 1.6; LA: 1.6; DF: 7; FOS: 3.7; Na: 300; M: calcium, phosphorus, iron, magnesium, zinc, iodine, potassium, copper, manganese, selenium; V: A, D, E, C, B1, B2, niacin, B6, folic acid, B12, biotin, and pantothenic acid.
I	Chocolate coated satiating bars	Satiating bars. Crunchy. With glucomannan and L-Carnitine. Double action: satiating and fat-burning. Keep your appetite under control with this delicious snack. Vitamin enriched. Made with glucomannan, a vegetable fibre that swells up to 100 times its volume in contact with water, and with L-carnitine to encourage and accelerate the burning of accumulated fat.	EV: 420; P: 27.5; CH: 42.5; TF: 12.5; DF: 10; Na: 92.5; M: potassium, calcium, magnesium, phosphorus, iron, zinc, copper, selenium, iodine, manganese; V: A, D, E, C, B1, B2, B12, niacin, folic acid, and pantothenic acid.
J	Chocolate flavoured meal replacement for weight control	2 bars = 1 meal.	EV: 402; P: 28; CH: 41; SU: 23.5; TF: 12.5; SF: 8.6; LA: 1.2; DF: 6.5; Na: 200; M: calcium, magnesium, phosphorus, iron, iodine, zinc, potassium, manganese, copper, selenium; V: A, D, E, C, B1, B2, B3, B6, B12, biotin, pantothenic acid, and folic acid.
K	Chocolate flavoured high protein bar with sweeteners, 20% chocolate, no added sugars	17 g pure protein. This diet is an excellent, lasting way to lose and control weight successfully. 1 g sugar, 2 g net carbs per portion. This product can be used at all stages of the Atkins diet. If you are trying to achieve or keep to your ideal weight, these bars are a delicious and nutritious way to achieve your aim.	EV: 400; P: 29; CH: 30; SU: 1.6; PO: 27; G: 18; MA: 8.5; ST: 1.5; TF: 21; SF: 12; DF: 11; and Na: 220.

[a] EV: energy value expressed as kcal/100 g. P: proteins; CH: total carbohydrates; SU: sugars; PO: polyols; G: glycerin; MA: maltitol; FR: fructose; S: sucrose; L: lactose; ST: starch; TF: total fat; SF: saturated fat; UF: unsaturated fat; MUF: monounsaturated fat; PUF: polyunsaturated fat; LA: linoleic acid; αLA: α-linolenic acid; γLA: γ-linolenic acid; DF: dietary fibre; FOS: fructooligosaccharides; Na: sodium; M: minerals; and V: vitamins. All the contents expressed as g/100 g of product; αLA, γLA y Na expressed as mg/100 g of product.