Development of diet and light desserts and their inclusion in the menu of a food service unit

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Abstract

In today's scenario of chronic diseases, many diet and light products are already in the marketplace for a population of about 30 million consumers, mostly diabetic, obese, hypertensive, hyperlipidemic, hypercholesterolemic, and others. There are, however, few diet and light options in a Food Service (FS). Thus, the objective is to develop diet and light desserts to be included in a menu of FS. Recipes were surveyed on websites and other units, assessing cost, variety, preparation time and acceptance of the desserts. Seven desserts were approved: two reduced in fat, four with no sucrose and reduced in fat, and one with no lactose.Thus it was possible to prepare healthier desserts for special groups and demonstrate the feasibility of production of diet and light desserts preserving sensory patterns and with affordable costs.

Keywords: Desserts. Diet. Light. Food Service.

Introduction

Recent studies have shown that the regular consumption of the Western pattern diet, characterized by high intake of red meat, whole milk products, sweetened beverages, sugars and sugary desserts, is directly associated with the risk of developing obesity, cardiovascular diseases (FUNG et al., 2001) and diabetes (GITTELSOHN et al., 1998).

The rapid growth in the consumption of processed foods worldwide, supported by sophisticated marketing strategies developed by multinational companies controlling the industry, is one of the major causes of the global epidemic of obesity, diabetes, and other chronic diseases. Such overprocessed foods tend to present high fat, sugar and salt concentrations that are harmful to health (WHO, 2003).

In today's scenario of chronic diseases, hundreds of diet and light products are already available in the marketplace for a population of about 30 million people, among them diabetic, obese, hypertensive, hyperlipidemic, and hypercholesterolemic consumers, who, by choice, wish to keep good health conditions, normal weight, and good physical appearance (VILELA, 2000).

According to ANVISA (1998), light products are indicated for healthy populations, even though there is no need to use them to be on a healthy diet (BRASIL, 2006). Diet products, on the other hand, are indicated for population groups with specific needs.

Foods are classified as light foods if they have low or reduced levels of any nutrient and/or energy value in relation to a reference food of the same group (ANVISA, 1998). Foods are classified as diet foods if some components such as sugar, salt, gluten, etc., are inexistent. This does not mean reduction of the caloric value of the respective food (VIEIRA; CORNELI, 2007).

In addition to the industrialized products, such demand also includes Food Services (FS), which, in order to achieve their goals as health promoters, should offer nutritionally balanced foods and meet their costumers' sensory quality criteria (AMORIM et al., 2005), including diet and light preparations for those with specific dietary needs.

In this context and seeking to meet the consumers' requests, this study aimed to develop desserts with low concentrations of fat and sugar-free for a FS unit where such options have not been available.

Methodology

The recipes survey comprised data collection in specialized websites, in technical and scientific literature, in preparation datasheets (PDS) of the FS' traditional recipes and in recipes developed in a previous study for another FS unit of the same chain (KARL, 2009). The information collected was adjusted for the tests, having some ingredients changed and/or replaced to characterize them as diet/light foods, as well as to adapt them to the usual

servings and ingredients used in the unit. To select the recipes, the following criteria were considered: cost, preparation time, variety of recipes and groups (diet and light).

To assess the recipes appropriateness according to *diet* and *light* classifications, the reference used was the classification established by ANVISA (1998), as follows:

Total fats: **low or light**: maximum of 3g/100g of the preparation. **Reduced**: minimum reduction of 25% in relation to the reference food. Difference must be higher than 3g/100 g.

Sugar (sucrose or lactose): **low or light**: maximum of 5g/100g and maximum of 40 kcal/100g of the preparation. **Diet:** maximum of 0.5g of the reference disaccharide/100g of the preparation, or a maximum of 0.5g of total fat/100g of the preparation (ANVISA, 1998).

The production cost of the desserts was determined by carrying out price surveys of the ingredients at the unit's suppliers and other establishments. The recipes with similar costs to the usual costs of the FS unit were approved for the tests.

The recipes were tested at the unit's kitchen, and the servings of each dessert were defined according to the FS pattern, as well as the presentation – with photographic record, which was part of the FS composition. Identification tags were prepared, showing the name of the dish, classification (diet, light or diet and light), and nonexistent and/or reduced ingredient: sucrose (sugar), lactose or lipids (total fats).

The evaluation of the food acceptability was performed by the unit's kitchen staff and by administrative employees of the same company at the day of completion of each recipe. They received servings of the dessert to be evaluated, the evaluation form and instructions to complete it with the following scores: "very good", "good" "satisfactory", "bad" and "very bad". We used the evaluation form adapted from Isensee (2008), a method that describes "flavor", "texture" and "appearance" of the preparations as requirements to be assessed. The results were compiled and assessed to determine the approval of the recipe or need for changes. The recipes that were considered acceptable were those that had a total score higher than 50% in the "very good" and "good" criteria for all requirements. At first it was not possible to perform the tests with the customers, but at the unit one can communicate suggestions in writing.

The data collected during the recipes tests were used to build the preparation datasheets, and for this purpose we adopted the PDS model (using Microsoft Excel 2003) already existing for other preparations in the unit (PUDLA; SOUZA, 2010).

The values for energy, carbohydrates, proteins, lipids, and sodium were calculated by using the nutritional information contained in the products labels or the Brazilian Table of Foods Composition (NEPA-UNICAMP, 2006). When not found in said reference, the data were then taken from the Table of Foods Composition of Philippi (2002). To construct the PDSs, the

nutritional aspects that should be highlighted were assessed – which, in the case of desserts are ratings relating to the amount of lipids and sugar and presence or absence of lactose.

The sodium (Na) concentrations were evaluated according to criteria adapted from the Food Standards Agency (FSA-UK), which rates the levels of sodium as high, medium and low per 100g of food. To do so, the amounts of salt were converted into the corresponding amount of sodium, thus obtaining the following rating: **high -** over 600mg of Na/100g of food; **medium -** between 120 and 600mg of Na/100g of food; and **low –** below 120g of Na/100g of food.

Results and discussion

Seven diet and light desserts were developed to be included in the unit's menu, namely: light coconut custard (reduced fats and calories), strawberry with light chocolate "brigadeiro" (kind of truffle) (reduced fats), diet and light lemon mousses (reduced fats and calories, no sucrose), diet and light pineapple puddings (reduced fats, no sucrose), diet chocolate cream (no lactose), diet and light passion fruit mousses (reduced fats and calories, no sucrose), and diet and light chilly strawberry cream with ricotta (reduced fats, no sucrose).

The desserts were prepared at the FS unit, and the preparation time was appropriate to the production time schedule. The PDS were then developed, standardized to yield 20 servings each. The serving's weight was determined considering the standard package, the serving' size of the desserts already existing at the FS unit, and cost per serving. The list of the ingredients for 20 servings of each dessert is described in Chart 1.

The desserts with lower weight servings were diet and light lemon mousses to maintain the same standard volume of the original version of the dessert, and the lactose-free diet chocolate cream for having higher costs and higher energy density. The serving with higher weight was diet and light chilly strawberry cream with ricotta.

Once the PDSs were developed with defined serving's volume, it was possible to determine the amount of energy, macronutrients and sodium per 100 g and per serving of the dessert (Table 1).

Chart 1 – List of the ingredients for 20 servings of each dessert developed

Name of the dessert, yield and serving's weight	Ingredients and quantities
Light coconut custard 20 servings of 110 g each	Skim milk (1.5 l), light condensed milk (360 g), light coconut milk (330 g), corn starch (120 g), dried plum (60 g), defatted, unsweetened grated coconut (50 g), sweetener (10 g)
Strawberry with light chocolate "brigadeiro" (kind of truffle) 20 servings of 20 g each	Strawberry (630 g), light condensed milk (610 g), skim milk (290 ml), light dairy cream (270 g), chocolate powder (70 g), corn starch (50 g), sugar (30 g)
Light and diet lemon mousse 20 servings of 90 g each	Lemon juice (1.8 l), natural yogurt (1.5 l), sweetener (200 g), colorless, unflavored gelatin (40 g)
Diet and light pineapple pudding 20 servings of 110 g each	Pineapple (2.04 kg), skim milk (1.8 l), diet vanilla pudding (120 g)
Diet chocolate cream (w/o lactose) 20 servings of 80 g each	Soya cream (800 g), chocolate powder (600 g), sugar (400 g), strawberry* (120 g), vanilla (40 g), grapes* (40 g)
Diet and light passion fruit mousse 20 servings of 110 g each	Concentrated passion fruit juice (3.27 l), natural yogurt (1.36 l), natural passion fruit pulp (250 g), sweetener (230 g), colorless, unflavored gelatin (20 g)
Diet and light chilly strawberry cream with ricotta 20 servings of 125 g	Water (1.25 l), strawberry (620 g), natural yogurt (500 ml), fresh ricotta (250 g), skimmed milk powder (200 g), diet unflavored gelatin (30 g), sweetener (50 g)

* Fruits to decorate the dish

Table 1 – Quantity of energy, proteins, lipids, carbohydrates, and sodium per 100 g and per serving of light and diet desserts. Florianópolis/SC, 2010.

Preparation Per 100g and per serving	Energy (Kcal.)	PTN(g)	LIP(g)	CHO(g)	
Light coconut custard					
Per 100g	100.5	3.8	2.9	14.9	88.1
Per serving (110g)	103.8	4.2	3.2	15.0	96.95
Strawberry with light "brigadeiro" ("truffle")					
Per 100g	123.7	3.8	1.9	22.8	48.8
Per serving (120g)	149.8	4.6	2.4	27.5	58.57
Diet/ light lemon mousse					
Per 100g	125.8	5.6	2.6	20.0	94.3
Per serving (90g)	111.8	4.7	2.3	18.0	84.89
Diet/light pineapple pudding					
Per 100g	92.8	3.3	0.1	19.7	91.7
Per serving (110g)	81.6	3.6	0.1	21.7	100.9
Diet lactose-free chocolate cream					
Per 100g	333.9	4.4	12.8	50.2	13.2
Per serving (80g)	267.0	3.5	10.3	40.2	10.65
Diet /light passion fruit mousse					
Per 100g	148.8	4.5	2.4	27.3	52.2
Per serving (110g)	163.2	5.0	2.6	29.9	57.54
Diet /light chilly strawberry cream with ricotta					
Per 100g	71.1	5.1	1.5	9.3	60.7
Per serving (125g)	86.5	6.4	1.9	11.7	75.99

As shown in Table 1, all desserts, except for the diet chocolate cream (lactose-free), have less than 3g of lipids per 100g, as defined by ANVISA to be considered as light food. You can also see that, among the developed desserts the diet/light pineapple pudding contains fewer calories, proteins and lipids per serving. The lactose-free, diet chocolate cream has more calories, with greater amounts of lipids and carbohydrates – because it is the only recipe that contains sugar besides soya cream, which also contains more calories and lipids.

Regarding the sodium evaluation, it showed that all desserts had low concentrations of this element according to the classification adopted by FSA (2009), even if using some dietetic sweeteners rich in this nutrient. It was also noticeable that the ingredients that contributed most to sodium were diary products.

Therefore, the work performed met the recommendations of Directive 6 of the Food Guide for the Brazilian Population (BRASIL, 2006), which deals with the foods production industry and the need to reduce fats, sugars, and salt from the foods produced.

Regarding costs, the preparation with higher value per serving was diet chocolate cream (without lactose) due to the fact that it contains more expensive ingredients, like soy cream and chocolate powder. The diet/light chilly strawberry cream with ricotta was the preparation with the lowest cost: besides the low cost of the ingredients, it produced good yields.

The results of the acceptability test in percentage, as scored by the local employees, are shown in Table 2. It is worth noting that no respondent mentioned "bad" and "very bad".

Table 2 – Results of the acceptability test as a percentage of diet and light desserts, as performed with employees of the FS unit. Florianópolis/SC, 2010.

Preparation	FLAVOR			TEXTURE			APPEARANCE		
	Very good	Good	Satisfactory	Very good	Good	Satisfactory	Very good	Good	Satisfactory
Light coconut custard	40	55	5	55	42	3	55	39	6
Light strawberry w/ "brigadeiro" ("truffle)	35	60	5	35	65	0	35	65	0
Diet/ light lemon mousse	13	77	10	31	56	13	50	50	0
Diet /light pineapple pudding	41	46	13	31	56	13	46	46	8
Diet lactose-free chocolate cream	54	33	13	47	46	7	67	33	0
Diet/ light passion fruit mousse	60	35	5	50	45	5	70	30	0
Diet/light chilly strawberry cream with ricotta	80	12	8	45	45	10	78	22	0

The dessert with the highest score regarding flavor and appearance (or appeal) was the diet/light chilly strawberry cream, while the light coconut custard stood out for its texture. No respondent chose either "bad" or "very bad". Therefore, considering the "satisfactory" criterion, the less accepted desserts regarding texture were the diet/light lemon mousse and diet/light pineapple pudding. With respect to flavor, the lactose-free diet chocolate cream and diet/light pineapple pudding were the less accepted desserts. Regarding appearance, the diet/light pineapple pudding also had the highest percentage of "satisfactory" scores, 8%, and this was the dessert with the lowest acceptance rate. According to what was observed in the evaluations such low approval rate is due to the residual taste of the sweetener present in the diet pudding preparation used.

Disparities in the evaluation of the recipes can be related to the dietary pattern of the group that carried out the evaluation, because most of them reported that they often eat very sugary foods. Thus, it is recommendable to extend the evaluation to other FS' consumers, who also have a communication channel available to write suggestions.

Still, the results were positive for all evaluations, and all recipes developed in the period of time were approved, because all of them had an approval rate limit established. Similar results were found by Klemba et al. (2007), when the evaluators, when proving strawberry gelatin in the original, diet and light versions, approved the sugar-free, low-calorie preparations, in some cases even showing preference for the latter versions. In the study performed by Mercer et al. (2008), there was also an acceptance level above the expectations for diet and light desserts, despite the tasters have not been used to eating desserts in these versions.

Conclusions

In this study, it was possible to develop low fat, sugar-free desserts without raising the sodium levels, as required by the food service unit and the consumers' request, being also approved in the acceptability test performed by the collaborators, captive consumers in the unit. Yet, there is the need of further evaluations with other consumers.

With the inclusion of these new recipes, the overuse of confectionery creams and premixes rich in hydrogenated fats and refined sugar was also reduced, thus contributing to the attainment of the principles of healthy eating habits. Finally, it was possible to demonstrate the viability of offering healthier options to the consumers, without causing impacts on the production costs and on the sensorial pattern of the desserts already produced.

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