

Development of a table of total carbohydrate counting with classification of cholesterol-saturated fat index and sodium adapted to the Brazilian Northern Region

Nashara Gleyce Farias Leão¹
Viviane do Socorro Lima Barroso²
Manuela Maria de Lima Carvalhal²
Fábio Costa de Vasconcelos³
Daniela Lopes Gomes⁴

¹ Universidade Estácio de Sá, Programa de Pós-graduação em Nutrição Clínica: Prática e Metabolismo. Belém-PA, Brasil.

² Universidade Federal do Pará, Programa de Pós-graduação em Nutrição Oncológica. Belém-PA, Brasil.

³ Universidade da Amazônia, Curso de Nutrição. Belém-PA, Brasil.

⁴ Universidade de Brasília, Programa de Pós-graduação em Nutrição Humana, Curso de Nutrição. Brasília-DF, Brasil.

Correspondence
Daniela Lopes Gomes
E-mail: danilg.nutri@hotmail.com

Abstract

Diabetes Mellitus is a group of metabolic disorders that result in hyperglycemia. Education in diabetes mellitus is a relevant factor in the treatment, and an increasing the level of knowledge and skills in the corresponding diet may further the control of the disease and improve the quality of life. A Carbs Counting Table with classification of Cholesterol-Saturated Fat Index and Sodium, adapted to the Brazilian Northern Region was created. It is a study structured on a documentary research, which investigated the composition of carbohydrates, saturated fat, cholesterol and sodium of 162 regional foods and preparations. The table is an educational tool that helps the nutritionist in the care of diabetic patients by providing information that will bring greater independence to patients regarding their diet. In spite of having a limited range of food types, the table provides support for the patient in their decision on what to eat, for a better metabolic control, important for people with chronic diseases.

Key words: Diabetes Mellitus. Nutrition Education. Diet. Nutritive Value.

Introduction

Diabetes Mellitus (DM) corresponds to a series of metabolic disorders that result in hyperglycemia conditions associated with abnormal functioning of pancreatic beta cells or peripheral insulin resistance. Treatment involves education-related aspects, which seeks to further self-care and autonomy of the patients with this pathology.^{1,2} First-choice therapy consists of a balanced diet, suitable to the individual needs, and the practice of physical activity, which improves the quality of life and reduces the risk for development of associated diseases.¹

Although the Brazilian Diabetes Society (SDB)³ considers the treatment of this disease difficult, Almeida, Moutinho & Leite⁴ recognize that gradual and continuous health education can help achieve significant reduction of diabetes complications, besides improving the quality of life throughout the disease process.

Among the educational tools that are available, materials such as manuals and textbooks stand out. In this regard, an adaptation of the SDB's handbook on carbohydrates counting to the North Region of Brazil⁵ seems to be a promising initiative, particularly when it takes into account an assessment of salt and fat levels in the foods in question, once there are no manuals available containing these items.

Therefore, thinking about the benefits of diabetes-oriented health education, the patient's difficulty in following the diet, lack of information on the nutritional composition of regional foods and possible consequences of non-adherence to dietary guidelines, the aim of this study was to develop a carbohydrate counting table with cholesterol-saturated fat index (CSI) and sodium content, adapted to the North Region of Brazil.

Method

It is a study structured on a documentary survey of tables containing centesimal composition of foods, and experimental, conducted at the Dietetic Laboratory of the University of Amazonia (LD-UNAMA), from February to March 2012.

After developing a list of the foods and dishes, we selected 122 foods from the List of Food Exchanges or Substitutes contained in the *Cartilha de Orientação sobre o uso da contagem de carboidrato adaptada para a Região Norte*⁶ (Guide to the Use of Carbohydrate Counting Adapted to the North Region). Twenty-seven foods of the group of meats and eggs (containing dishes and assorted sausages) and eight foods of the group of milk and derivatives were added to the Table of Total Carbohydrates Counting developed by Mendes and Monteiro.⁷ Five foods usually consumed in the region were also included. In total, the table contained 162 foods and/or dishes.

To prepare the table, the 162 selected foods were characterized into five groups: (1) Cereals, tubers and roots; (2) Meats and legumes; (3) Milk and derivatives (4) Dishes; and (5) Sugars and sweets.

Then, it was necessary to tabulate the carbs, saturated fat, cholesterol and sodium counts, using the following tables: Table of Equivalent Foods developed by Tuma & Monteiro;⁸ Table of Foods Composition, by UNICAMP;⁹ Table of Foods Composition, by Azoubel, Garcia & Naves;¹⁰ Table of Chemical Composition of Foods, by Franco;¹¹ Table for Evaluation of Food Consumption in Home Cooking Measurements, by Pinheiro et al.;¹² Table of Food Equivalents, Home Cooking Measurement and Chemical Composition, by Pacheco;¹³ and compilation using the *software* Nutrilife 7.5.¹⁴

The foods were weighed at the LD-UNAMA using a Toledo digital scale, model 9094c/4, with a maximum capacity of 3kg and minimum of 1g, following the weighing technique dictated by Araújo, Montebello and Botelho¹⁵ for the foods whose portion values were not found. Then, they were classified into three groups, according to the sodium level, identified by numbers: group 3 for the foods with high sodium concentrations (≥ 400 mg in 100 g/ml of food); group 2 for the foods with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food); and group 1 for the foods with regular or low sodium concentrations (< 200 mg in 100 g/ml of food).

This classification was based on data published by the Ministry of Health, which considers a food with a sodium content above 400 mg in 100g/ml portion as rich in sodium.¹⁶ To define the groups interval, we considered that a 50% reduction would be classified as moderate, and below this value it would be considered as with low sodium content.

Regarding CSI, it was calculated according to the formula described by Abreu, Pinheiro & Torres (2010):¹⁷ $CSI = (1.01 \times \text{g of saturated fat}) + (0.05 \times \text{mg of cholesterol})$.

Taking into account that the CSI measure for each food should be adequate to the food intake, the recommended index for men and women under 55 years should be 30 and 25, respectively, and for men over 55 years it should be limited to 27 and for women it should be limited to 22.

Results

A total of 162 foods were included in the study and separated into groups, which are show in Table 1 (group of cereals, roots and tubers), Table 2 (group of meats and legumes), Table 3 (group of milk and derivatives), Table 4 (group of dishes) and Table 5 (group of sugars and sweets), including the levels of carbohydrates, sodium and CSI.

Table 1. Regional table of Total Carbohydrates Counting adapted to the North Region of Brazil, with classification of cholesterol-saturated fat index (CSI) and sodium – Group of cereals, roots and tubers. 2012.

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	NA** (mg)	CSI***
White rice, cooked	50	2 tablespoons (full)	12.75	² 137.6	0.10
Brown rice, cooked	60	3 tablespoons (full)	8.73	¹ 69.52	0.11
Oats	27	2 tablespoons (full)	15.5	¹ 0	0.30
Potato, cooked	60	2 tablespoons (full)	12	¹ 2.4	0.01
Sweet potato, cooked, salt-free	60	2 tablespoons (full)	14.58	¹ 7.8	0.05
Whole meal cracker (Club Social)	25.8	3 units	17	³ 200	1.31
Cream cracker	20	4 units	13.94	³ 180	1.01
Whole meal cream (Vitarella)	10	2 units	6.6	³ 56.6	0.57
Corn flour biscuit	20	4 units	15.5	¹ 0	0.00
Marie biscuit	24	4 units	15.5	¹ 0	0.00
Water and salt biscuit	24	3 units	16.8	³ 186	0.61
Purple yam, cooked	55	1 serving spoon (full)	10.4	¹ 0.55	0.00
Breakfast cereal (corn with sugar)	24	1/2 cup	21.3	³ 97.2	0.01
Farofa (Roasted manioc flour)	15	1 tablespoon	11.75	¹ 0.15	0.25
Farofa of jerky beef (3:1)	200	1 serving spoon (full)	133.8	² 736.5	5.25
Manioc flour	58.4	1 tablespoon (full)	14.28	¹ 1.6	0.02
Tapioca flour	12	1 serving spoon (full)	10.38	¹ 1.44	0.00
Raw yam	60	1 medium piece	16.55	¹ 4.8	0.02
Homemade noodle, cooked	65	1 pasta fork	18.4	¹ 0.65	0.03
Manioc, cooked	63	1 small piece	18.05	¹ 5	0.06

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Manioc*, fried, salt-free	100	1 small piece	27	¹ 8	2.63
Corn, canned	24	2 tablespoons (full)	4.6	³ 111	0.00
Corn, fresh, raw	90	4 tablespoons (full)	25.7	¹ 0	0.23
Fruit panettone (Bauducco)	80	1 medium slice	27	¹ 124	7.25
Potato bread	50	1/2 unit (medium)	18.3	³ 504.5	1.15
Sweet bread, homemade	50	1/2 unit (medium)	28.01	² 150	1.69
French bread w/o the inside	30	1 unit (medium)	17.2	³ 174	0.00
French bread with the inside	50	1 unit (medium)	29.3	³ 324	0.51
White tin loaf	25	1 slice	14.1	³ 158.35	0.18
Cheese bread	50	1 and 1/4 of unit	18	³ 325	3.72
Whole meal bread	50	2 slices	24.9	³ 253	0.35
Hamburger/hot dog bun	25	1/2 unit	12.3	³ 119.75	0.27
Popcorn, popped	25	1 cup	11.8	³ 221	1.24
Tapioquinha, dried	75	1 small unit	66.51	¹ 0.75	0.00
Tapioquinha with coconut	100	1 small unit	70.26	¹ 5.75	7.50
Tapioquinha with margarine	90	1 small unit	66.51	² 250.75	3.61
French bread toast	24	3 medium units	17.9	³ 198.96	0.20
Industrial toast	30	3 small units	22	³ 180	0.61
Industrial whole meal toast	30	3 medium unit	22	³ 125	0.61
Canapé toast (Visconti)	30	9 units	22	³ 180	0.30

* CHO: Carbohydrates

** Na: Sodium

***Cholesterol-saturated fat index

¹ Group 1 – with normal or low sodium concentrations (< 200 mg in 100 g/ml of food).

² Group 2 – with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food).

³ Group 3 – for foods with high sodium concentrations (\geq 400 mg in 100 g/ml of food).

Table 2. Regional table of Total Carbohydrates Counting adapted to the North Region of Brazil, with classification of cholesterol-saturated fat index (CSI) and sodium – Group of meats and legumes. 2012.

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Meatball (broiled beef)	90	3 small units	6.6	¹ 160.3	10.78
Beef escalope, fried breaded	65	1 small unit	7.15	² 154.7	8.61
Steak parmigiana	150	1 medium unit	25.7	³ 1285	23.31
Beef steak, broiled	75	1 small unit	0.1	² 207.8	9.09
Beef liver steak, broiled	100	1 medium steak	7.9	³ 698.36	26.93
Shrimp, cooked	225	1 and ½ serving spoon	0	² 504	22.54
Poultry meat, fried	110	1 small thigh	1.1	¹ 104.5	8.94
Beef, fat-free, cooked	35	1 medium piece	0	¹ 19.6	5.89
Beef, ground	75	3 tablespoons (full)_	0	¹ 92.25	7.4
Buffalo meat	40	1 medium piece	0	¹ 0	2.06
Pork – rib, toast	90	1 medium piece	0	¹ 56.7	15.81
Pork – rib, cooked	90	1 medium piece	0	¹ 90.9	15.21
Dried meat (chopped lean beef jerky)	90	5 tablespoons	0	³ 1298.7	6.75
Textured vegetable protein (soy meat)	25	1 tablespoon	7.72	¹ 0.748	0.01
Chicken heart	40	8 medium units	0	¹ 38	5.16
Dobradinha (stew made with tripe)	35	1 tablespoon	0	¹ 10.15	3.41
Peas, canned	81	3 tablespoons	10.77	² 162	0.00
Black bean, cooked (only grain)	17	1 tablespoon	2.38	¹ 0.34	0.02
Pinto bean, cooked	80	1 medium ladle	10.88	¹ 1.6	0.08
Chicken, baked (skinless thigh)	125	1 large unit	0	¹ 110	9.73
Chicken, cooked (skinless drumstick)	75	1 medium unit	0	¹ 120	9.63

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Chicken peas, cooked	80	4 tablespoons	21.86	¹ 5.51	0.17
Lentil, cooked	80	4 tablespoons	16	¹ 1.62	0.00
Beef tongue	90	3 slices	0	¹ 58.5	13.31
Pork sausage (Sadia)	25	1/4 of unit	0.6	³ 202.5	1.31
Mortadella (Sadia)	15	1 thin slice	1.06	³ 124.8	0.93
Egg, boiled	50	1 medium unit	0.2	¹ 55.8	10.89
Egg, fried	50	1 medium unit	0	² 158.84	12.15
Fish, fried (hake fillet)	100	1 medium fillet	0	¹ 115	5.06
Turkey, frozen, roast	35	1 medium piece	0	³ 219.8	2.16
Turkey ham, cooked (light, Sadia)	15	1 thin slice	0.19	³ 162.3733	0.47
Italian salami	20	1 medium slice	0.45	³ 213	2.29
Sausage (Aurora)	24	3/4 of medium unit	1.5	³ 255	3.02
Sardines in oil	20	1 medium unit	0	² 58	4.1
Soybean, cooked	140	7 tablespoons	13.76	¹ 1.4	1.88
Pork crackling	10	1 tablespoon	0	¹ 12.5	2.47

* CHO: Carbohydrates

** Na: Sodium

***Cholesterol-saturated fat index

¹ Group 1 – with normal or low sodium concentrations (< 200 mg in 100 g/ml of food).

² Group 2 – with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food).

³ Group 3 – for foods with high sodium concentrations (\geq 400 mg in 100 g/ml of food).

Table 3. Regional table of Total Carbohydrates Counting adapted to the North Region of Brazil, with classification of cholesterol-saturated fat index (CSI) and sodium – Group of milk and derivatives. 2012.

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Whole milk curds, industrial, with sugar (Brasleite)	200	1 pot	33	¹ 123	2.62
Goat milk	150	1 small glass	6.75	¹ 75	4.85

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Soy milk	240	1 medium glass (full)	4.38	¹ 0.375	0.48
Condensed milk (Itambé)	15	1 tablespoon	8.5	¹ 12.5	0.96
Skim milk	240 ml	1 medium glass (full)	11.28	¹ 175.2	0.48
Whole milk powder	26	2 tablespoons (full)	10	² 85	5.54
Skim milk powder	30	3 tablespoons (full)	15.6	³ 189.6	0.00
Fermented milk (Yakult)	80	1 unit	13	¹ 30	0.00
Whole milk	200	1 medium glass (full)	10	¹ 130	5.29
Fruits yoghurt	140	1 unit	24.5	¹ 105	3.51
Skim natural yoghurt	170	1 pot	12	¹ 107	0.00
Plum yoghurt, light (Canto de Minas)	200 ml	1 glass	7.6	¹ 80	0.00
Minas-type fresh cheese	30	1 medium slice	0.96	¹ 9.3	4.38
Minas-type fresh cheese, light	30	1 medium slice	1.2	³ 153.6	1.87
Mozzarella cheese	15	1 thin slice	0.3	² 55.93	2.57
Parmesan cheese, national	15	1 tablespoon	0.55	³ 279.15	3.47
Prato cheese (similar to Danbo cheese)	15	1 thin slice	0.2	³ 144.73	3.33
Ricotta cheese, national	30	1 medium slice	0.9	¹ 25.24	3.27
Cream cheese, homemade-type (Antunes)	30	1 tablespoon	1	³ 145.7	6.13
Cream cheese, light (Poços de Caldas Leitbom)	30	1 tablespoon	1.2	³ 166.8	1.63

* CHO: Carbohydrates

** Na: Sodium

***Cholesterol-saturated fat index

¹ Group 1 – with normal or low sodium concentrations (< 200 mg in 100 g/ml of food).

² Group 2 – with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food).

³ Group 3 – for foods with high sodium concentrations (\geq 400 mg in 100 g/ml of food).

Table 4. Regional table of Total Carbohydrates Counting adapted to the North Region of Brazil, with classification of cholesterol-saturated fat index (CSI) and sodium – Group of dishes. 2012.

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Rice and chicken	125	5 tablespoons (full)	27.7	² 261	1.71
Baião de dois (dish made with rice and beans)	145	1 small slotted spoon (full)	29.6	¹ 134.85	1.17
Rice balls	60	1 medium unit	29.72	³ 766.75	4.23
Codfish croquette	56	4 medium units	7.26	³ 318.6	3.90
Hot dog	125	1 medium unit	25.71	³ 813.93	9.87
Fish stew (caldeirada paraense)	249	1 large ladle (full)	4	¹ 196.82	19.25
White maize pudding	60	1 medium slice	44.63	¹ 87	1.26
Caruru*, unsalted (stew made from okra, shrimp, palm oil, nuts)	91	1 small ladle (full)	15.3	¹ 95.38	7.19
Stuffed crab shells	203	3 units	128.8	¹ 183	14.13
Cheeseburger	140	1 medium unit	36.4	³ 1202.6	14.95
Chicken croquette, (small, Sadia)	30	1 small unit.	7.5	³ 159	1.16
Corn couscous	85	1 small piece	33.6	¹ 118.71	10.30
Mini chicken pot pie	75	1 medium unit	23	¹ 84.3	2.52
Esfíha with ground meat stuffing	80	1 medium unit	31.2	² 311.06	2.87
Cattleman's beans	15	1 tablespoon (full)	7.6	³ 223.8	1.60
Chicken in the tucupi sauce (broth made with wild manioc)	340	1 plateful	8.9	¹ 105	11.51
Lasagna Bolognese (Batavo)	190	1 small portion	22.8	³ 1122.46	6.55
Four-cheese pasta	350	6 pasta forks	48.5	³ 2239	66.42
Spaghetti Bolognese	110	1 slotted spoon (full)	24.3	¹ 166.8	0.93
Maniçoba (made with manioc leaves, dried meat, salted pork)	500	1 plateful	81.9	³ 5436	24.11
Pamonha (paste made from sweet corn and milk)	160	1 unit	32	¹ 66	2.02

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Cheese pastel (fried pastry filled with cheese)	60	1 unit	10.57	¹ 108	3.08
Duck in the tucupi sauce	350	1 plateful	8.9	¹ 232.8	13.61
Potatoes, mash (with milk and margarine)	50	2 tablespoons	9.4	³ 298.1	5.62
Pirão (fish broth thickened w/ manioc)	30	1 tablespoon (full)	10.95	¹ 29.35	0.86
Pizza (peperoni)	140	1 large slice	35.89	³ 569.36	5.52
Kibbeh (mini, Sadia)	50	2 units	6	³ 464	2.92
Chicken potato salad	100	4 tablespoons (full)	9.56	² 212.64	2.19
Bean and noodle soup (Knorr)	25	2 tablespoons (yielding 330 ml)	15	³ 907	0.30
Vegetable and rib meat soup (Maggi)	25	2 tablespoons (yielding 330 ml)	18	³ 740	0.00
Tacacá (stew made with paracress, tucupi and dried shrimps)	400	1 medium bowl	14.3	¹ 146.8	4.98
Pará vatapá (stew made w/ dried shrimp and coconut milk)	84	1 medium ladle (not full)	13.7	¹ 92.66	7.18

* CHO: Carbohydrates

** Na: Sodium

***Cholesterol-saturated fat index

¹ Group 1 – with normal or low sodium concentrations (< 200 mg in 100 g/ml of food).

² Group 2 – with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food).

³ Group 3 – for foods with high sodium concentrations (\geq 400 mg in 100 g/ml of food).

Table 5. Regional table of Total Carbohydrates Counting adapted to the North Region of Brazil, with classification of cholesterol-saturated fat index (CSI) and sodium – Group of sugars and sweets. 2012.

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Sugar	30	1 tablespoon (full)	29.85	¹ 4.68	0.00
Pineapple preserve in sugar syrup	100	1 medium slice	29.77	¹ 6.3	0.00

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Coconut water, industrial	300 ml	1 bottle	14	96 ¹	0.00
Sweet rice	40	1 tablespoon (full)	18.7	¹ 40.21	1.20
Candies	20	4 units	5	¹ 0	0.00
Cereal bar	25	1 unit	20	² 50	0.00
Beiju (manioc bread, tapioca)	15	1 small square unit	0.945	¹ 0	0.00
Beiju with coconut	17	1 small square unit	1.245	¹ 0.4	0.60
Chocolate wafer	15	2 units	10.1	¹ 20.55	0.99
Corn meal cake, plain	50	1 small slice	26.22	¹ 59.93	3.00
Tapioca flour cake	40	1 small slice	34.6	² 107.4	10.57
Manioc cake	40	1 small slice	19.2	¹ 44.4	3.48
Pudding cake	150	1 medium slice	48.3	¹ 244.09	11.20
Sonho de Valsa bonbon (made with chocolate and cashew nut filling)	21.5	1 unit	13	² 46.58	2.35
Brigadeiro (kind of truffle made with condensed milk and powdered chocolate)	30	2 small units	18.6	¹ 36.96	2.60
Sugarcane juice	150	1 small glass	27.3	¹ 0	0.00
Coke	150	1 small glass	16.85	¹ 3.45	0.00
Milk chocolate (Nestlé)	30	1 small bar	18	¹ 0	5.30
Cupuaçu cream (made with the pulp of cupuaçu fruit)	100	1 dessert bowl	23	¹ 45.7	10.94
Banana pudding (Mindy)	40	1 tablespoon (full)	30	¹ 0	0.00
Milk sweet (dulche de leche) (São Lourenço)	40	1 tablespoon (full)	22	¹ 53	1.62
Green papaya sweet	40	1 tablespoon (full)	37.45	¹ 0	0.00
Flour with milk (Nestlé)	21	3 tablespoons	14.4	¹ 27	0.94
Guava sweet	30	1 tablespoon (full)	22.23	¹ 1.2	0.00
Honey	15	1 tablespoon (full)	12.36	¹ 0.6	0.00
Chocolate mousse	50	2 tablespoons (full)	16.9	¹ 25.4	11.97

Foods	Qty. (g or ml)	Home cooking measurement	CHO* (g)	Na** (mg)	CSI***
Chocolate powder, Nescau	20	2 tablespoons (full)	17	¹ 21	0.00
Chocolate trifle	180	1 small piece	69.45	¹ 181	26.13
Chocolate popsicle (Chicabon)	65	1 unit	19	¹ 51	1.01
Milk pudding	90	1 small slice	30.58	¹ 79.82	7.81
Quindim (baked dessert made with egg yolks, ground coconut, sugar)	35	1 medium slice	15.95	¹ 11.04	5.71
Rapadura (brown sugar)	50	1 medium piece	46	¹ 0	0.00
Ice cream, vanilla-type	50	1 tablespoon (full)	14.1	¹ 38	4.28

* CHO: Carbohydrates

** Na: Sodium

***Cholesterol-saturated fat index

¹ Group 1 – with normal or low sodium concentrations (< 200 mg in 100 g/ml of food).

² Group 2 – with moderate sodium concentrations (200 to 399 mg in 100 g/ml of food).

³ Group 3 – for foods with high sodium concentrations (> 400 mg in 100 g/ml of food).

Discussion

With respect to the use of the Total Carbohydrate Counting (TCC), along with other methods traditionally used in diet planning, the glycemic index and food pyramid should also be considered in the context of healthy eating¹⁸, in order to enable patients to have a more effective quantitative monitoring of carbs intake.¹⁹

Based on the data found, it could be seen that some dishes, such as *dobradinha* (stew made with tripe of cow and beans), *baião de dois* (dish made with rice and beans), rice and chicken, *farofa* (side dish made with flavored, toasted coarse manioc flour) and *vatapá paraense* (stew made with dried shrimp and coconut milk) are included in group 1. It should be noted that the dishes may change according to the individual taste, and for analysis of the dishes cited, we considered only the ingredients of standard recipes.^{8,19} Therefore, special care should be given to the consumption and preparation of these foods.

Regarding the CSI, the values found for the portions of 4-cheese pasta (66, 42), *maniçoba* (beef and sausage stew with manioc leaves) (24, 11), chocolate pavê or trifle (26, 13), steak parmigiana (23, 31), beef liver steak (26, 93) and cooked shrimp (22, 54) are already above the recommended

allowances for women aged 55 years and over. However, it is not necessary to eliminate these foods totally from the diet, but they should be consumed with moderation and occasionally.

The beef liver steak indicated high levels of CSI and sodium, according to the Table of Home Cooking Measurement Equivalents and Chemical Composition of Foods,¹³ but this food is rich in heme iron and fat-soluble vitamins. Therefore, intake of this food should be considered according to the patient's overall clinical status.

Considering the proven applicability of food self-monitoring methods, TCC and CSI, associated with a sodium intake limited to 2,400 mg/day, we have a didactic tool covering three major risk factors to the development of diseases such as diabetes mellitus and high blood pressure.

Conclusion

The Total Carbohydrates Counting with CSI and sodium concentrations adapted to the North Region of Brazil may help health professionals in the care of diabetic patients, and the patients themselves in the choice of adequate foods.

References

1. Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes, 2013-2014. São Paulo: AC Farmacêutica; 2014.
2. Gomes DL, Tuma RB, Silva EB, Silva RL, Costa LCF, Ferreira EAP. Regionalização da tabela oficial de contagem de carboidratos para o tratamento de pacientes diabéticos no estado do Pará, Brasil. *Cad. Saúde Coletiva* 2011; 19:203-207.
3. Sociedade Brasileira de Diabetes. Dados sobre Diabetes Mellitus no Brasil. São Paulo, 2011. [acesso em 23 maio 2011] Disponível em: <http://www.diabetes.org.br/sala-de-noticias/97-estatisticas/342-dados-sobre-diabetes-mellitus-no-brasil>
4. Almeida ER, Moutinho CB, Leite MTS. A prática da educação em saúde na percepção dos usuários hipertensos e diabéticos. *Saúde em debate* 2014; 38(101):328-337.
5. Sachs A, Baptista DR, Rossi G, Monteiro JBR, Bruno L, Alvarez MM. Manual oficial de contagem de carboidratos para profissionais da saúde. Rio de Janeiro: SBD; 2009.
6. Silva EB, Silva RL, Gomes DL, Tuma RB, Ferreira EAP. Cartilha de orientação sobre o uso da Contagem Total de Carboidratos adaptada para a Região Norte. Belém: UEPA; 2011. 24 p.
7. Monteiro TAA; Mendes ACL; Gomes DL; Araújo MS; Ferreira, E.A.P. Índice de qualidade da dieta de adultos portadores de diabetes tipo 2 submetidos a contagem total de carboidratos. *Revista Nutrição em Pauta* 2013; 9-15. Disponível em: http://www.nutricaoempauta.com.br/lista_artigo.php?cod=2339

8. Tuma R, Monteiro R. Tabela de alimentos equivalente. 2 ed. Manaus: Nilton Lins; 2004.
9. Universidade Estadual de Campinas. Tabela de composição dos alimentos - TACO. 4. ed. São Paulo: UNICAMP; 2011. [acesso em: 20 nov. 2011]. Disponível em: http://www.unicamp.br/nepa/taco/contar/taco_4_edicao_ampliada_e_revisada
10. Azoube ILMO, Garcia RWD, Naves MMV. Tabela de composição de alimentos. In: Oliveira JED, Marchini JS. Ciências nutricionais: aprendendo a aprender. 2 ed. São Paulo: Sarvier; 2008.
11. Franco G. Tabela de composição química dos alimentos. 10. ed. São Paulo: Atheneu, 2008.
12. Pinheiro ABV, Lacerda EMA, Benzecry EH, Gomes MCS, Costa VM. Tabela para avaliação de consumo alimentar em medidas caseiras. v. 5. São Paulo: Atheneu; 2008.
13. Pacheco M. Tabela de equivalentes, medidas caseiras e composição química dos alimentos. 2. ed. Rio de Janeiro: Rúbio; 2011.
14. Grupo Life Solution (GLS). Nutrilife (Software) versão 7.5 for windows. Curitiba: Programe Software Design e Consultoria Ltda; 2011.
15. Araujo WMCA, Montebello NP, Botelho R, Borgo LA. Alquimia dos alimentos. 3 ed. Distrito Federal: SENAC; 2014.
16. Brasil. Ministério da Saúde. Resolução RDC nº 24 de 15 de junho de 2010. Dispõe sobre a oferta, propaganda, publicidade, informação e outras práticas correlatas cujo objetivo seja a divulgação e a promoção comercial de alimentos considerados com quantidades elevadas de açúcar, de gordura saturada, de gordura trans, de sódio, e de bebidas com baixo teor nutricional, nos termos desta Resolução, e dá outras providências. Diário Oficial da União 29 jun. 2010; Seção 1, n. 122, p. 46-47.
17. Abreu ES, Pinheiro MAN, Torres EAFT. Elaboração de um sistema de pontos para intervenções dietéticas em indivíduos hiperlipidêmicos. Revista Brasileira de Cardiologia 2010; 23 (5):18-25.
18. Cuppari L. Guia de nutrição: nutrição clínica no adulto. 3. ed. Barueri, SP: Manole; 2014.
19. Gomes DL, Ferreira EAP, Souza CMC. Automonitoramento e adesão a dois tipos de regras nutricionais em adultos com diabetes Tipo 2. Acta Comportamental, 2012; 20(3):327-342.

Received: January 16, 2015

Reviewed: March 31, 2015

Accepted: August 20, 2015