A Practical Guide Regarding Carbs and Sugar Intake Amount for Controlling Postprandial Plasma Glucose (A Part of GH-Method: Math-Physical Medicine)

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Abstract

This paper provides effective guidelines to control postprandial plasma glucose for type 2 diabetes (T2D) patients. Most food nutrition literatures use terminologies for measurements such as serving size, grams, calories that can be difficult for T2D patients to understand and let alone to be used as a guide. The author decided to use "hand" either palm or fist as the measurement. A hand's volume is 380 cc which is approximately 160% larger than a standard cup measuring 237 cc. The author studied the impact of food nutrition on diabetes since 2012. He has collected ~8 million food nutrition data and applied optical physics and artificial intelligence to investigate and analyze the relationship between food and glucose. He lists two partial results of high-carb foods and sample vegetables to show how their carbs/sugar intake amount impact postprandial plasma glucose values.

Introduction

This paper provides simple yet effective guidelines to control postprandial plasma glucose (PPG) for type 2 diabetes (T2D) patients.

Method

Most food nutrition literatures use terminologies for measurements such as serving size, grams, calories that can be difficult for T2D patients to understand and let alone to be used as a guide. The author has decided to use "**Hand**" (either palm or fist) as the measurement unit since *you never leave home without them*. A hand's volume (380 cc) is about 160% size of a cup (237 cc). The author has studied the impact of food nutrition on diabetes since 2012. He has collected ~8 million food nutrition data and applied optical physics and artificial intelligence to investigate and analyze the relationship between food and glucose. In this paper, he only lists two partial results of food and PPG values for high-carb foods (Table 1) and sample vegetables (Table 2).

Table 1: *High-carb foods*

Food Type (Carbs Concentrated)	Hand Carbs (gram)	PPG Level (2 mg/dL)	PPG Level (2.5 mg/dL)
Corn Tortillas	17	34	43
Rye Toast	20	41	51
Sour Dough	21	42	52
Indian Naan	24	48	60
Flatbread	30	61	76
French Bread	43	87	108
Fried Dough	49	98	123
Mashed Potato	53	106	132
Boiled Potato	64	128	161
Egg Noodle	65	129	162
Cooked Corn	66	132	165
Bread Crumbs	66	132	165
Spaghetti	69	138	173
White Rice	71	141	177
Pearled Barley	71	142	178
Brown Rice	72	144	180
Food Carbs Average	50	100	125
Corn Flour	140	279	349
Whole Wheat Flour	140	280	349
White Flour	153	306	383
Corn Starch	188	376	469
Carbs Average	70	140	175

Table 2: Vegetables

Raw Vegetable (1 Hand)	Carbs/Sugar (g)	PPG 92 mg/dL	Cooked Vegetable (1 Hand)	Carbs/Sugar (g)	PPG 92 mg/dL
Eggplant	10.6	21	Cooked Eggplant	18.3	37
Mushroom	5.5	11	Cooked Mushroom	18.8	38
Tomato	25.6	51	Cooked Tomato	24.8	50
Red Pepper	24.4	49	Cooked Red Pepper	23.8	48
Carrots	28.9	58	Cooked Carrots	27.3	55
Yellow Squash	10.0	20	Cooked Yellow Squash	19.9	40
Spinach	2.0	4	Cooked Spinach	12.1	24
Celery	16.0	32	Cooked Celery	15.4	31
Okra	13.2	26	Cooked Okra	23.1	46
Kale	10.7	21	Cooked Kale	14.4	29
Cabbage	13.1	26	Cooked Cabbage	17.7	35
Cauliflower	12.3	25	Cooked Cauliflower	15.1	30
Raw Averaged (gram)	**14.4**	**29**	**Cooked Average (gram)**	**19.2**	**38**

In his previous publications, he has mentioned the following four key findings:

(1) PPG has direct correlation with food quality, i.e. carbs/sugar intake amount, contributing ~40% of PPG formation. Carbs/sugar intake amount determines PPG's peak value.

(2) Food quantity contributes to body weight, where weight has direct correlation with FPG (~20% of A1C), but not with PPG (~80% of A1C).

(3) Each gram of carbs/sugar is converted into ~2 to 2.5mg/dL of PPG.

(4) Post-meal exercise contributes another 40% of PPG formation. Each thousand steps of walking may reduce ~5 to 10mg/dL of PPG depending upon weight, severity of diabetes, and overall metabolism.

Results

Table 1 lists high-carb food's quantity of carbs/sugar (grams per hand) and their impact on PPG. Foods such as bread, potato, rice, noodle has an average of 50 grams per hand and convert into 100-125mg/dL of PPG. Food materials such as flours and starches has an average of 155 grams per hand and convert into 310-388mg/dL of PPG.

Table 2 provides 12 sample vegetables with various colors and carbs/sugar contents (grams per hand) and their impact on PPG. The chopped raw vegetables have an average carbs/sugar of 14.4 grams per hand and convert into 29mg/dL of PPG. The cooked vegetables, with less water and higher carbs/sugar amount, have an average of 19.2 grams per hand and convert into 38mg/dL of PPG. If you eat one hand of mixed raw and cooked vegetables, your average carbs/sugar intake is 16.8 grams per hand and convert into 34mg/dL of PPG.

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In summary, the following three conclusions can be drawn:

(1) If you eat salad with uncut and raw vegetables, you can eat two handfuls, approximately one normal plateful, because they have both water and air space. This may still provide ~15 grams of carbs/sugar and ~30mg/dL of PPG. This is close to one handful of cooked vegetables, less water and no air space.

(2) If you are a severe T2D patient (A1C >8.0%), try to avoid eating high-carb foods and replace them with a combination of vegetables and protein-rich food such as cheese, fish, or chicken to reduce your hunger. If you are a non-severe T2D patient (A1C <8.0%), you may eat only half of your hand size for high-carb foods (50%) to avoid excessive carbs amount which builds up PPG's peak value.

(3) Every one-thousand walking steps post meal would reduce your PPG approximately 5 to 10mg/dL depending upon your body weight, T2D conditions, and MI.

Conclusion

The specific objective of this paper is to provide simple yet practical guidelines to T2D patients regarding the carbs/sugar intake amounts in their meals and the impact on their PPG values.

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