

# Diabetes

You Can Eat Everything

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## Foreword

Majority of people with diabetes are basically fond of eating, and it is this fondness that probably is a contributing factor in the causation of their disease. The diagnosis of diabetes comes to them as a shock, because it brings a prohibitive restraint on the pleasure that they used to have in eating. They are generally given a very limited range of choices in food, with hardly any room for changes according to their personal preferences. Then the meal plans given in such recommendations, rarely ever conform to their socio-cultural eating peculiarities. Such meal plans are hence unacceptable to majority of the people, and what is unacceptable is frequently ignored, resulting in poor dietary compliance.

The situation has always pained me. It is understandable that people with diabetes have to put up with some form of dietary modification nonetheless, but there is no reason why this modification has to be more tough and stiff than is absolutely necessary. We can surely make some room for squeezing in a bit of personal preferences to make their meal plans more palatable and hence more acceptable.

We all at the Diabetes Foundation of Pakistan were also convinced that we should suggest a meal plan to our people with diabetes, which is more akin to our socio-cultural peculiarities. The introduction of carbohydrate counting at the international level was a very attractive innovation in this regard, but unfortunately there was no scientific data available regarding our local foods. We still decided to take up the task, and the result of our efforts, which spanned over more than a year, is now in your hands. We know it is not perfect, and we urge upon you to point out the deficiencies as and when you find them, but we are still feel proud that we have at least provided a foundation on which a better building may one day be erected.

Here I shall like to take an opportunity to thank all the people who have contributed to this milestone work. I shall like to thank first of all, the anonymous cooks and bakers who carried out the boring task of repeatedly weighing ingredients of certain foods to help me in establishing basic figures like average amount of flour (and other things alike) used in one “Chapati”, a “Pooree” or a “Naan”. My special thanks are due to Dr. Imtiaz Hassan, the medical director of Diabetics' Institute of Pakistan, who provided books from his personal library, and Dr. S. Abbas Raza, the young and dynamic endocrinologist from Shaukat Khanum Memorial Cancer Hospital, who critically reviewed the manuscript a number of times and gave indispensable suggestions. I am also grateful to Miss Ayesha Khan the nutritionist and dietician from Doctors Hospital Lahore, who provided some very basic scientific information.

I need to doubly thank my wife Mrs. Shabana Asif who contributed not only her share as the secretary general of the Diabetes Foundation of Pakistan, but had also the nerve to put up with my year long commitment with this task

Chouhdary Niaz Ahmad of the Sange-e-Meel Publications deserves gratitude from the readers of this booklet as well, who took up the whole task of financial arrangements, printing and publishing this book and donated it to Diabetes Foundation of Pakistan for distributing it free of cost to diabetics in Pakistan.

I urge in the end upon all who have diabetes themselves or in their dear ones, to come forward and join us in helping the diabetics to lead healthy, complication free and useful lives despite diabetes. If they have the slightest passion to contribute in this noble task, Diabetes Foundation of Pakistan is the right forum for them, where we shall always welcome them with our open arms.

Yours,

***Dr. Asif Mahmood Kadri***

President

Diabetes Foundation of Pakistan

# Diabetes and Your Diet

We all know that some form of dietary modification is required in all who are affected by diabetes, and this is probably the most unpleasant part of its management from the patients' point of view. This is because majority of the dietary advice and meal plans given to them do not match with their personal preferences. Most of the diet charts made for diabetics have little room for changes, exchanges and alternates. Poor compliance is the obvious sequel. But human nature has an inherent passion to confront challenges and resolve difficulties, and diabetic diet is no exception. A lot has been done in this regard, and there are more than one ways of addressing these issues. Personalized diet charts, food exchange lists and lately carbohydrate counting are a few of them.

We shall focus mainly on carbohydrate counting in this booklet, but a brief introduction to some of the common meal planning tools will be very appropriate in the beginning.

## The Food Pyramid

Food pyramid is a very simple tool to understand the basic dietary principles. It consists of a pyramid made of six tiles (or layers) laid on each other in such a way that the broadest lies at the bottom and the smallest is at the top. Each tile (layer) represents a different food group, e.g. the largest basal layer represents green vegetables and grains, which should constitute the largest proportion of our daily food, while the smallest layer at the top represents sweets and fats which should be taken sparingly.

Food pyramid is indirectly the most popular method of dietary intervention in Pakistan, in which patients are only told that they should abstain from sweets, take less fat and generally reduce the portion size. This method can work very well for those who are trying to control their diabetes with lifestyle modification only, or else who are taking insulin sensitizers like metformin. When however, you start taking blood sugar lowering medicines like insulin or a sulfonylurea, you need a more elaborate and precise meal plan.

## Diet Charts

These are detailed meal-plans devised according to your calorie requirement, and usually consist of three major and three small meals.

This again is a popular tool in Pakistan. The main disadvantage is the limited room for changes to accommodate variety in menus. If a diet chart is devised specifically for a particular person, according to his / her physiologic requirements in accordance with age, sex, build, physical activity, and personal preferences; such diet charts can be extremely useful. If on the contrary, a pre-printed generic type of chart is given to every diabetic, it cannot obviously be appropriate for all. Such charts may do more harm than good to majority of the users. Moreover the limited room for adapting these charts to the personal requirements and preferences leads to poor compliance.

## Exchange Lists

This has been a very popular tool in the west over the past two decades, because it offered the maximum room for accommodating personal preferences until recently when carbohydrate counting was introduced. All foods are categorized into six groups, and a list is provided for each group in this system, namely vegetables, fruits, milk, carbohydrates, meat and fats. These lists have been fashioned in such a way that all the items in a list are nutritionally equal. The items can hence be exchanged for each other in the same list. The details in the following lists can explain the concept very easily.

### 1. List of Vegetables:

- Half a cup of cooked vegetables like bottle ground (kaddu), teenda, okra (bhindi) zucchini (kaali toree), bitter ground (karela), brinjal (baingan), cabbage, cauliflower and all green leafy vegetables
  - 1½ cup of raw vegetables like carrots, cabbage, capsicum, onions, cucumber, radish and iceberg lettuce etc.
  - Two small tomatoes

All these are nutritionally equal, and each one of them provides 5 grams of carbohydrates, 2 grams of protein, and 25 Calories.

### 2. List of Fruits:

A medium sized apple, a guava, a peach, a kino, orange, ¾ banana, 2 dates, 2 medium slices of melon or water melon, 3 plums, ½ a cup of sliced mango, a cup of papaya, 5 straw berries, 3 apricots, and 15 jaman.

All these are nutritionally equal, and each one of them provides 15 grams of carbohydrates, and 60 Calories.

### 1. List of milk and milk products:

A cup of milk, a cup of yogurt and 3 tablespoons of dried milk

All these are nutritionally equal, and each one of them provides 12 grams of carbohydrates, 5 grams of protein, 5 grams of fats and 150 Calories.

1. List of Meat exchanges:

30 grams of meat, 30 grams of fish / prawn, 30 grams of low fat cottage cheese, whites of two eggs, 2 tablespoons of minced meat, ½ cup cooked legumes

All these are nutritionally equal, and each one of them provides, 7 grams of protein, 5 grams of fats and 55 Calories.

2. List of Bread cereal and starch:

A 30 gram slice of bread, ½ cup of cooked porridge, ½ cup boiled rice, 1/3 cup of corn, a 50 gram potato, 2½ table spoons of wheat flour, ½ cup of cooked pulses / beans / grams and chick peas.

All these are nutritionally equal, and each one of them provides 15 grams of carbohydrates, 3 grams of protein, 1 gram of fats and 80 Calories.

3. List of fats:

One table spoon of Ghee, / oil / butter / mayonnaise, 8-10 pea-nuts,

All these are nutritionally equal, and each one of them provides 5 grams of fats, and 45 Calories.

If your physician provides you these lists and then tells you for example that you shall take two exchanges of carbohydrates, one exchange of meat, one exchange of fruit and one exchange of milk in the breakfast, you can enjoy a reasonable degree of variety in your breakfast and still be within the safe limits of nutritional recommendations for you. This is a very useful method and people who have learnt it, and do not find it difficult, can continue to use it. The only disadvantage with this method is that most of the diabetics find it difficult to master and follow.

# Carbohydrate Counting in Diabetes

When you think of dietary recommendations in diabetes, the first thing that springs to your mind is, abstinence from sweets and sugars! New concepts are however being introduced in nutritional intervention for diabetes, which allow you to eat almost everything including sweets. Carbohydrate counting is one of them.

The calories in our diet come from three sources, namely carbohydrates, proteins and fats. They all affect our blood sugar differently in their own peculiar ways. Carbohydrates (including natural sugars) however have the maximum effect and their effect is more direct. There are two very important facts in this regard, which we need to understand.

1. If you eat an equal quantity of carbohydrates (including some sugars and sweets at times) on different occasions, it will result in the same rise in your blood sugar on all occasions, regardless of the actual nature or source of these carbohydrates.
2. The main ingredient of our food that affects the blood sugar is carbohydrate. Most of the carbohydrates consumed in a meal, are broken down into sugars, which enters the blood within two hours, while proteins and fats have relatively little effect on our blood sugar.

It is these two facts that make the foundation of the concept of carbohydrate counting. It is the total quantity of carbohydrates (including sweets and sugars) in your meal that will determine your blood sugar after that meal.

## Advantages of Carbohydrate Counting

1. Of all the methods of meal planning, it is the easiest to learn.
2. It offers maximum freedom to the diabetics, in choosing a menu according to their personal preferences
3. It is easy to predict the impact of a meal on the rise of blood sugar after that meal
4. It is easy to incorporate canned food into your meal, simply by looking at the tin label
5. You can occasionally exchange a carbohydrate for sweets in this method

## How to use Carbohydrate Counting

There are two levels of carbohydrate counting, simple and advanced carbohydrate counting, but we shall focus mainly on the simple level in this booklet.

### *Simple carbohydrate Counting*

Your health team will calculate your daily carbohydrate allowance and shall divide this quota into appropriate servings for each meal in the daily mal plan. Now if you have a chart, which tells you the carbohydrate content of your daily food items (as is provided at the end of this booklet), you can easily make your own menus.

Lets us see for example if your medical team allows you 60 grams of carbohydrate at your breakfast, you can look up in t he carbohydrate content charts at the end of this book, add up your 60 grams in any way that please. The following two examples will help you to understand the spirit of this method.

#### (1)

Chapati (90 gram flour without fats)	$\frac{3}{4}$	45 G carbohydrate
Cooked green vegetable or meat	$\frac{1}{2}$ cup	3-4 G carbohydrate
Yogurt (as such or “Lassi”)	1 cup	12 G carbohydrate
<b><i>Total Carbohydrates</i></b>		<b><i>60 grams</i></b>

#### (2)

Chapati (90 gram flour without fats)	$\frac{3}{4}$	45 G carbohydrate
Cooked Pulses / beans / grams / chick peas	$\frac{1}{2}$ cup	15 G carbohydrate
<b><i>Total Carbohydrates</i></b>		<b><i>60 grams</i></b>

You can see that green vegetables and meat have very little carbohydrate and you can hence take a cup of yogurt as well in the first example, but when you take pulses / legumes in the second example, which contain 50% carbohydrate, you can not enjoy this privilege.

Similarly if potato filled “prathaas” are on the menu, and you don't want to deprive your self, you can take  $\frac{1}{2}$  a prathaa, with a cup of yogurt. What is important here is that you do not abuse this permission, because fried foods are not good for your heart, especially if you have diabetes, and these should only be taken once in a while.

You can ask a very pertinent question here, “a balanced diet is the one, that has all the ingredients of food like carbohydrates, proteins, fats, vitamins and minerals in their right proportions, then how shall a diet focusing only on carbohydrates be adequate for diabetics?”

The answer is very simple. Now that you are allowed to eat everything, you should add as much variety and diversity to your menus as you can. Variety is what shall bring your diet to a physiologic balance.

### ***Three basic rules to benefit from carbohydrate counting***

1. Eat everything in its turn, including grains, legumes, pulses, fruits, vegetables, meat and milk products.
2. Restrict your fat intake to a minimum, and try to stay away from animal fats as much as you can.
3. Stick to the recommendations of your health team regarding carbohydrate intake for each meal. Eat neither less, nor more!

### ***How much carbohydrate to take on each meal***

It will depend on many factors, like age, gender, body weight, and physical activity. Special situations like pregnancy, lactation, puberty, growth and disease may also necessitate further modifications. You should hence leave this judgment to your medical team. The carbohydrate allowance for an adult with moderate physical activity and normal weight is usually three major meals of 60 gram carbohydrates for male and 50 grams for the female. Three small snacks of 25-30 grams may also be required for people on insulin or sulfonylurea. The meal plan for an average adult with moderate activity would hence come out something like the following

<b>Meal</b>	<b>Time</b>	<b>Carbohydrates</b>
Breakfast	0800 AM	60 grams
Morning tea	1100AM	25-30 grams
Lunch	0200 PM	60 grams
Evening tea	0500 PM	25-30 grams
Dinner	0800 PM	60 grams
Late supper	1030-1100 PM	25-30 grams

Some of us, who wake up early for the Morning-Prayer and are in the habit of eating something on waking, can take a cup of milk. If however they have problems in maintaining their blood sugar within limits, they can talk to their health care provider.

Some others in the habit of exercising (or going for a walk) on empty stomach, may run the risk of a low blood sugar during or after this activity, and can take a portion of their breakfast ½ an hour before they plan to exercise. Any problems in this regard can obviously be discussed with your medical team.

### **Some important questions regarding Carbohydrate counting**

People with diabetes, who have been using the old fashioned, pre-printed diet charts for years, with

The new method of carbohydrate counting. Lets try to address them up one by one.

***Can I have sweets within the limits of my carbohydrate quota?***

Since we are counting only the carbohydrate grams in the food, all diabetics may be eager to know whether they can have some sweets as well. They will be anxious to know the difference between a dessert and a fruit (e.g. guava) containing equal carbohydrate.

If we put all the complex controversies aside and look only at the basic facts, a sweet (e.g. a laddoo) weighing 60 grams will roughly offer 45 grams of carbohydrates, while the same would be provided by half a kilogram of guava. A laddoo which has a very small volume and is hence incapable of satisfying your appetite, may consume the entire quota of carbohydrates for one meal, and leave you hungry, while ½ a kilogram of guava will offer enough volume to gratify your appetite. Fruits offer certain other advantages in addition to volume as well.

The simplest answer to this question is hence that you can certainly take some sweets at times, but you should mix them in your menus very tactfully, using simple everyday common sense.

***Is there no difference between refined and the complex carbohydrates in this system?***

It was generally believed until 1995 that the blood sugar rises more rapidly after eating refined carbohydrates and sugars than it would do after eating complex carbohydrates like whole grain foods, pulses, legumes, and fruits etc; and that it is easier to maintain blood sugar within limits if you abstain from refined carbohydrates and sugars. The theory however has not been adequately substantiated through research. Majority of the medical scientists now believe that the total quantity of carbohydrates in your meal is the main factor that determines your post meal blood sugar. Complex carbohydrates and raw food with lots of fiber have their own advantages nonetheless, and you should generally prefer them over the refined carbohydrates.

***What is fiber and what is its significance in diet?***

Foods of plant origin contain certain compounds (usually complex carbohydrates like cellulose), which cannot be digested and absorbed in the blood. They cannot hence affect your blood sugar. Such substances are referred to as “fiber”. Fiber is a very important part of our diet. It is not nutritive but adds bulk to our food and helps in early satiety. This bulk helps to control constipation as well. It is generally recommended that an average man should consume roughly 50 grams of fiber in a day. Research studies have repeatedly suggested that high fiber content in the diet of diabetics may be helpful in achieving better control of their blood sugar. The soluble fiber found in oatmeal and fruits is helpful in maintenance of the fat balance in addition.

We can easily conclude here that people with diabetes should depend more for their food on whole grains, fruits, vegetables and legumes, but that does not mean that they should be totally denied the pleasure of all other eating possibilities.

## Make Your Own Menus

You can now easily make your personalized menus with the help of the table of carbohydrate content given at the end of this book. We are however giving a few examples here to assist you. You can use them as a demonstration for understanding the concept better.

### Common Breakfast Menus Containing 60 Grams of Carbohydrate

You can use anyone of these menus, or you can use them all in turn if you please. The cup used here for measurement is the standard 150 ml teacup, the teaspoon means a 5 ml spoon, a tablespoon measure 15 ml, and the serving spoon is 25 ml.

#### Traditional breakfast Menus

(1)

Food Item	Serving Size	Digestible Carbohydrates
Chapati (domestic bread, 90 gram whole wheat flour)	$\frac{3}{4}$	45 gram
Cooked pulses (legumes / grams / chick peas / beans)	$\frac{1}{2}$ cup	15 gram
<b>Total</b>		<b>60</b>

(2)

Chapati (domestic bread, 90 gram whole wheat flour)	$\frac{3}{4}$	45 gram
Cooked Meat (Chicken /mutton / beef / fish / nihaari siri paye)	$\frac{1}{2}$ cup	4-5 gram
Yogurt / Lassi (Stirred yogurt)	1 cup	12 gram
<b>Total</b>		<b>60</b>

(3)

Chapati (90 gram, whole wheat flour)	$\frac{3}{4}$	45 gram
Cooked vegetable (The values are given for green vegetables. But if you take potatoes, carrots or arvee etc, take only half a Chapati. Or else you can drop the yogurt)	$\frac{1}{2}$ cup	4-5 gram
Yogurt	1 cup	12 gram
<b>Total</b>		<b>60</b>

(4)

Food Item	Serving Size	Digestible Carbohydrates
Bran Rusk	3	45 gram
Cream	1 Table spoon	2-3 gram
Doodh-Patee (tea leaves boiled in milk)	1 Cup	12 gram
<b>Total</b>		<b>60</b>

(5)

Bun (a form of bread)	1	45 gram
Butter	30 G	2-3 gram
Milk /Yogurt/ Lassi (stirred yogurt)	1 Cup	12 gram
<b>Total</b>		<b>60</b>

(6)

Chapati (90 gram, whole wheat floor)	1	60 gram
Pickle	One small piece	5 gram
<b>Total</b>		<b>60</b>

### Some Western Breakfast Menus

(7)

Bran Bread	3 Slices	45 gram
Butter / Cheese	30 gram	2 gram
Yogurt+ Ispagol Husk	1 cup	12 gram
<b>Total</b>		<b>60</b>

(8)

Bran Bread	3 Slices	45 gram
Sugar Free jam/ Jelly	1 spoon	6 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 gram
Apple 3 inch diameter (or any fruit with equivalent carbohydrate content)	½	6 gram
<b>Total</b>		<b>61</b>

(9)

Food Item	Serving Size	Digestible Carbohydrates
Corn Flakes	½ cup	30 gram
Low fat milk	1 cup	12 gram
Apricot/ guava/ pear (or any fruit with equivalent carbohydrate content)	250 grams	15 gram
<b>Total</b>		<b>57-60</b>

(10)

Bran Bread	3 Slices	45 gram
Chicken spread	2 t spoon	5 gram
Low fat milk	1 Cup	12 gram
<b>Total</b>		<b>62</b>

**Some Ceremonial Breakfast Menus  
With 60 gram Carbohydrates**

These recipes use large proportions of fats and highly refined flour, which can add to your risk of heart disease, they should hence be taken only once in a while

(11)

Prathaas (stuffed with radish, cauliflower / minced meat)	¾	45 gram
Yogurt (or raeta)	¼ cup	3 gram
Milk or Doodh-Patee (tea leaves boiled in milk)	1 cup	12 gram
<b>Total</b>		<b>60</b>

(12)

Prathaas stuffed with potato	½	45 gram
Yogurt (or raeta)	¼ cup	3 gram
Milk or Doodh-Patee (tea leaves boiled in milk)	1 cup	12 gram
<b>Total</b>		<b>60</b>

(13)

Food Item	Serving Size	Digestible Carbohydrates
Pooree (small fried bread made from fine wheat flour)	1	30 gram
Curry (chick peas and potatoes)	½ cup	8 gram
Halva (Fried wheat flour+Sugar+Water)	2 Table spoons	10 grams
Lassi (stirred yogurt)	1 cup	12 gram
<b>Total</b>		<b>60</b>

(14)

Naan (bread made from fermented fine flour)	¾	45 gram
Hareesa (Curry made from porridge and meat)	½ cup	15 gram
<b>Total</b>		<b>60</b>

(15)

Naan (bread made from fermented fine flour)	¾	45 gram
If made from equal dough, a Naan and a Chapati will have the same carbohydrates but the floor used in Naan is highly refined with little fiber, it should hence be taken occasionally		
Curry made from Chick peas	½ cup	15 gram
<b>Total</b>		<b>60</b>

### Lunch and Dinner Menus with 60 gram Carbohydrates

(16)

Chapati (90 gram, whole wheat floor)	¾	45 gram
Cooked Meat (Chicken /mutton / beef / fish/)	½ cup	3-4 gram
Yogurt / Raeta	½ cup	6 gram
Green Salad	½ cup	5 gram
<b>Total</b>		<b>60</b>

(17)

Food Item	Serving Size	Digestible Carbohydrates
Chapati (90 gram, whole wheat floor)	$\frac{3}{4}$	45 gram
Cooked Green vegetable (The values are given for green vegetables. But if you take potatoes, carrots or arvee etc, take only half a Chapati. Or else you can drop the yogurt)	$\frac{1}{2}$ cup	3-4 gram
Yogurt / Raeta	$\frac{1}{2}$ cup	6 gram
Fresh Green Salad	$\frac{1}{2}$ cup	5 gram
<b>Total</b>		<b>60</b>

(18)

Chapati (90 gram, whole wheat floor)	$\frac{3}{4}$	45 gram
Cooked potatoes /carrots/ arvee / turnips They have a high content of carbohydrates / you will hence have to drop the yogurt and salad)	$\frac{1}{2}$ cup	5 gram
<b>Total</b>		<b>60</b>

(19)

Boiled (or fried) Rice	1 cup	45 gram
Cooked pulses (legumes/ grams /chick peas / beans)	$\frac{1}{2}$ cup	15 gram
If you wish to take some yogurt or salad as well, you will need to cut on the rice portion		
<b>Total</b>		<b>60</b>

(20)

Pulao, Biryani or Khichri ((forms of fried rice)	1 cup	45 gram
Yogurt / Raeta	$\frac{1}{2}$ cup	6 gram
Green Salad	$\frac{1}{2}$ cup	5 gram
Papaya	$\frac{1}{2}$ cup	5 gram
<b>Total</b>		<b>61</b>

(21)

Food Item	Serving Size	Digestable Carbohydrates
Burger (Bun, one egg and one kabaab)		40 gram
Mayonnaise and Cole-slaw		10 gram
Apple 3 inch diameter (or equivalent fruit)		12 gram
Sugar-free cold-drink		0 gram
<b>Total</b>		<b>61</b>

(22)

Pizza	½ piece	45 gram
Mayonnaise and Cole-slaw	2 spoons	10 gram
Sauces and ketchup	2 spoons	5-8 gram
Sugar-free cold-drink	1	0 gram
<b>Total</b>		<b>62</b>

### Menus for Ceremonial Feasts

Ceremonies of all kinds are a part of our life, and we can neither avoid them nor we really need to. But eating at a ceremony is usually a test of judgment for the people with diabetes, because they find it difficult to decide what they should and what they should not eat. We are giving here two menus based on the common foods served at such feasts for you convenience.

(23)

Roasted meat (Chicken / fish/ beef)	One piece	5 gram
Naan / Chapati	½	30 gram
Curry / gravy	2-3 pieces	5 gram
Fresh green salad	½ cup	5 gram
Dessert	5 tea spoons	15-20 gram
<b>Total</b>		<b>60-65</b>

**(24)**

Food Item	Serving Size	Digestible Carbohydrates
Seekh Kabaab	3	5 gram
Pulao	1 serving spoon	30 gram
Curry / gravy	2-3 pieces	5 gram
Fresh green salad	½ cup	5 gram
Dessert	5 tea spoons	15-20 gram
<b>Total</b>		<b>60-65</b>

**Snacks Containing  
25-30 Grams of Carbohydrates**

People with diabetes who are using a blood sugar lowering agent e.g. insulin or sulfonylurea, are generally advised to take 3 smaller snack in the day, in addition to the 3 regular meals. These snacks are advised roughly 3 hours after each major meal. The carbohydrate content of this snack is generally half of the carbohydrate content of the major meal. We are giving here a few menus with 25-30 gram carbohydrates for your convenience, but you can make your own menus by referring to the chart of carbohydrate content of different foods.

**(25)**

Saltish cookies	2	20 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 gram
<b>Total</b>		<b>24</b>

**(26)**

Rusk	1	15 gram
Doodh-Patee (tea leaves boiled in milk)	1 cup	12 gram
<b>Total</b>		<b>27</b>

**(27)**

Sweet potato	½ cup	23 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 gram
<b>Total</b>		<b>27</b>

**(28)**

Food Item	Serving Size	Digestible Carbohydrates
Guava (or equivalent other fruit)	1 cup	14 gram
Saltish cookies	1	10 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 Gram
<b>Total</b>		<b>28</b>

**(29)**

Nimko (Fried pulses, legumes and pea nuts etc)	30 gram	12 gram
Doodh-Patee (tea leaves boiled in milk)	1 cup	12 gram
<b>Total</b>		<b>24</b>

**(30)**

Chicken patties / chicken roll	1	20 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 gram
<b>Total</b>		<b>24</b>

**(31)**

Vegetable patties / vegetable roll	½	20 gram
Tea (1/3 milk and 2/3 water, no sugar)	1 cup	4 gram
<b>Total</b>		<b>24</b>

## **Advanced Carbohydrate counting**

This method is very useful for those who take multiple daily injections of rapidly acting insulins, or else are using an insulin pump. The required units of their insulin are linked to the carbohydrate content of their food in such a way that a change in one can be calculated to find a matching change in the other.

You should learn to understand and use the information provided on the canisters of food, as well the use of different measuring devices like, cups and measuring spoons. You will also need to be able to assess the quantity of carbohydrates present in foods served at feasts and restaurants. Having mastered these skills, you maintain the record of your blood sugar, insulin used, and the carbohydrate count of your food for some time, and your health team works out a formula for you which you can use to determine your insulin dose required to neutralize a specific meal.

### Table of Carbohydrate Content in Common Foods

Food Item	Serving Size	Digestible Carbohydrates
<b>Grains</b>		
Plain Domestic Chapati (90 G flour)	$\frac{3}{4}$	45 G
Plain Tandoori Chapati (110 G flour)	$\frac{3}{4}$	55 G
Fermented Tandoori Chapati (110 G flour)	$\frac{3}{4}$	55 G
Naan (110 G flour)	$\frac{3}{4}$	55 G
Plain Prathaa (Deep fried Chapati-90G flour)	$\frac{3}{4}$	45 G
Prathaa Stuffed with radish (90G flour)	$\frac{3}{4}$	45 G
Prathaa Stuffed with Minced meat (90G flour)	$\frac{3}{4}$	45 G
Prathaa Stuffed with potatoes (90G flour)	$\frac{1}{2}$	55 G
Rice (cooked / boiled)	1 cup	45 G
Poori (Deep fried small chapaati-45 G flour)	One	30 G
One Ounce Bread slices (bran)	2	30 G
One Ounce Bread slices (white flour)	2	30 G
Rusk (plain)	2	30 G
Rusk (sweetened)	2	35 G
Boiled / smoked corn kernel	Medium	30 G
Corn Flakes	60 gram	50 G
Biscuits	2	20 G
<b>Milk and Milk Products</b>		
Milk / yogurt	1 cup	12 G
Cheese (cottage)	30 gram	3 G
Cheese (cheddar / Mozzarella / Swiss)	30 gram	1 G
Butter	30 gram	1 G
<b>Vegetables</b>		
All green leafy vegetables, bottle ground (kaddu), teenda, okra (bhindi) zucchini (kaali toree), bitter ground (karela), egg plant (brinjal / baingan), cabbage, cauliflower	$\frac{1}{2}$ cup cooked	
Peas	$\frac{1}{2}$ cup cooked	5 G

Food Item	Serving Size	Digestible Carbohydrates
Potatoes / Arvee	½ cup cooked	15 G
Sweet potatoes	½ cup cooked	23 G
Cucumber	½ cup Sliced	6 G
Carrot	½ cup Sliced	4 G
Radish	½ cup Sliced	1 G
Pumpkin	½ cup Sliced	10 G
Winter squash	½ cup Sliced	11 G
<b>Pulses and Legumes</b>		
Pulses / legumes / grams / chick-peas or beans	½ cup cooked	15 G
<b>Meat</b>		
Chicken / mutton / beef or fish	100 gram	7 G
<b>Fruits</b>		
Apricot	100 gram	8 G
Papaya	100 gram	10 G
Plums	One medium	8.5 G
Orange / Kino / Malta	One medium	30 G
Strawberry	1 cup sliced	15 G
Banana	One medium	27 G
Jaaman	15	15 G
Sheh-toot	½ cup	15 G
Watermelon	1 cup sliced	15 G
Melon	1 cup sliced	15 G
Sarda	1 cup sliced	15 G
Garma	1 cup sliced	15 G
Faalsa	1 cup	15 G
Loquat	100 gram	15 G
Berries	100 gram	15 G
Dates	2	15 G
Grapes	½ cup Sliced	15 G
Mango	100 gram	19.5 G
Pineapple	1 cup sliced	7 G

