



**DEPARTMENT OF ENDOCRINOLOGY,
DIABETES & METABOLISM,
CHRISTIAN MEDICAL COLLEGE, VELLORE**

**DIETARY INFORMATION FOR
DIABETES PATIENTS**

Role of Diet in Diabetes

Diet plays an important role in the management of Diabetes Mellitus. Eating the right foods at the correct time is crucial for maintaining acceptable blood glucose values. Knowing what food to eat, when to eat and how much to eat, helps one to monitor blood glucose levels and maintain it within the normal range. This gives him/her the confidence to lead a healthy normal life and achieve his/her maximum potential.

What is food composed of?

Foods we eat contain various components. This includes nutrients, fibre and water. Their role in our body is explained below:



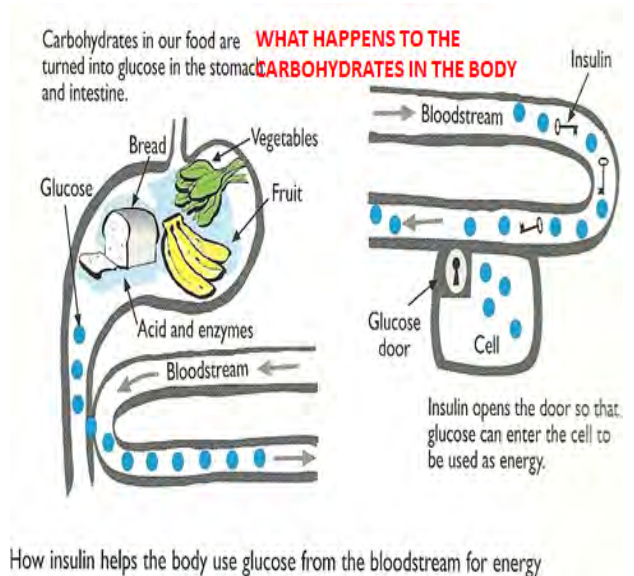
- Fat- gives us energy
- Vitamins –regulates body functions
- Minerals- regulates body functions
- Fibre- regulates blood glucose levels
- Water- regulates various functions

- **Carbohydrates- gives us energy**
- Proteins- body building

Carbohydrates directly cause an increase in the blood sugar levels. There are different types of carbohydrates and their effect on raising the blood sugar levels vary.

What happens to Carbohydrates in the body?

Carbohydrates are broken to sugars. This enters every body cell with help of insulin to provide energy. When food is broken into sugars, it enters the blood stream. Some foods are broken faster and appear in the blood stream quickly. Some foods take longer to be broken, hence appear slower in the blood stream.



Glycaemic index of foods

Glycaemic index is a measure of the rise in blood sugar after consumption of a particular food as compared to a reference food. Foods are classified according to their glycaemic index. They are foods with high GI, moderate GI and low GI. The foods with high GI are easily digested by the body and readily appear as blood sugar in the blood stream. Those with a low GI is less readily appearing in the blood stream. High GI foods must be restricted and those with low GI must be encouraged.

- ▶ High (>70) Cereals
- ▶ Medium (56-69) Vegetables
- ▶ Low (<55) Legumes, millets

Very High sugar foods

Foods like table sugar, honey, jaggery are called simple sugars since they are readily digested by the body resulting in a sudden rise in blood sugars. They have a very high GI. These sugars are incorporated in foods like sweets, soft drinks, pastries, cakes and they are best **avoided**.

High carbohydrate foods

Carbohydrates form the major portion of our Indian diet. Food items like rice, idli, dosa, chapathi, appam, puttu, paratta have a high proportion of carbohydrates (65-80%). These foods are easily digested and cause an elevation in blood sugars. They have a high GI. They should be eaten in limited amounts to prevent high blood sugars. Underground vegetables like potatoes, yam, colocasia, tapioca are also starchy foods and must be **restricted**.

Moderate carbohydrate food

Whole gram pulses are moderate sources of carbohydrates (55-60%). However carbohydrates present in pulses are only gradually released into the blood stream. This is because of their high **fibre** content. Hence including them in meals helps to keep blood sugars under control. They are the low GI foods.

What is fibre? Is it good for health?

Fibre is a type of carbohydrates present in food which our body cannot digest. It gets evacuated with the faeces. Previously fibre was considered a waste product with no health benefits. But scientific studies have proved that fibre has immense advantages. The benefits of fibre are that it:

- ✓ Lowers sudden rise in blood sugars- lowers glycaemic index of foods.
- ✓ Lowers cholesterol levels in blood
- ✓ Provides satiety
- ✓ Aids in easy bowel movements
- ✓ Helps in weight reduction

Which foods contain fibre?

- Whole grains- unpolished rice, whole wheat flour chapathis, ragi preparations
- Whole gram pulses- sundal preparations
- Fruits with edible skin and seed (guava, grapes, banana, pomegranate..)
- Vegetables- green leafy vegetables

USE MORE FIBRE RICH COMPLEX CARBOHYDRATE FOODS!



The fibre present in these foods traps the sugars and only gradually releases it into the blood stream, thereby preventing a sudden rise of sugars in the blood stream. Thus it is important to include at least one serving (100gm) of fibre rich food with each meal.

How much carbohydrates should be eaten?

The amount of carbohydrates that can be eaten depends on the individual's nutritional status (underweight/ normal weight /overweight /obese), age of the person, gender, activity levels, medication, presence of other co-morbidities. The recommendation is that it should constitute 60-65% of the total calories (ICMR 2010). The dietician will help you decide on the carbohydrates you need and recommend the cereal portion (major source of carbohydrate)for each meal.

What foods can be taken in unrestricted amounts? Foods that do not cause a rise in blood sugar like black coffee, black tea, unsweetened lime juice, clear soups, salads, greens, sugar free drinks, flavoured water. These foods are low in carbohydrates and calories and can be taken in unlimited amounts.

How often should a person with Diabetes eat?

A diabetes patient should eat at regular times. They should follow a 3 meal pattern with snacks in between. If on insulin medication, make sure you take your meals and insulin injections at the correct time. Insulin continues to work in the body for varying periods of time and

hence to prevent a low blood sugar situation (hypoglycaemia) from happening, long gaps between meals should be avoided. You should never miss your breakfast. The late night snack you take before going to sleep is very important as it helps to prevent a hypoglycaemic attack at night.

What to do during an episode of hypoglycaemia?

Hypoglycaemia occurs when your blood sugar falls below 70mg%. This can occur if you delayed your meals, in case of excessive physical activity or took the insulin injection but delayed your food. You may experience sweating/dizziness/loss of consciousness/shivering during a hypo attack. Please check your blood sugar and if it is below 70mg%, take 15gm (3 teaspoon) of glucose. Wait for 10 minutes and check blood sugars again. If it continues to be low, take another 15gm of glucose. After levels have reached acceptable levels (80mg% and above) take a meal or snack within 30 minutes. Always carry glucose with you wherever you go.

What are the foods that are to be avoided? Why?

Sugary foods like cakes, pastries, carbonated drinks, Indian sweets (laddoos, jellabis, etc.), ice-creams, lollipops, chocolates, sweets, jaggery, and honey are high in simple sugars and are easily absorbed by the body resulting in a sudden raise in blood sugars. These are best avoided.

What is a balanced diet?

A diet that contains adequate carbohydrates, proteins, fats, vitamins & minerals and fibre is a balanced diet as it meets our daily requirement. A picture of a balanced lunch/dinner is given below. A diabetes diet is a balanced diet.



LUNCH



DINNER

SNACKS

Are snacks important? When and why should I take snacks in between meals?

Snacks are very important to prevent hypoglycaemia in patients. They should be taken three hours after meals. This prevents the blood sugars from going too low, that is below 70mg%.

What are the snacks that I should take between meals?

Any of the foods below can be taken as a snack.

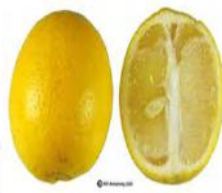


½ cup pulses

30 number

4 Arrowroot biscuits

200ml milk Veg Salad

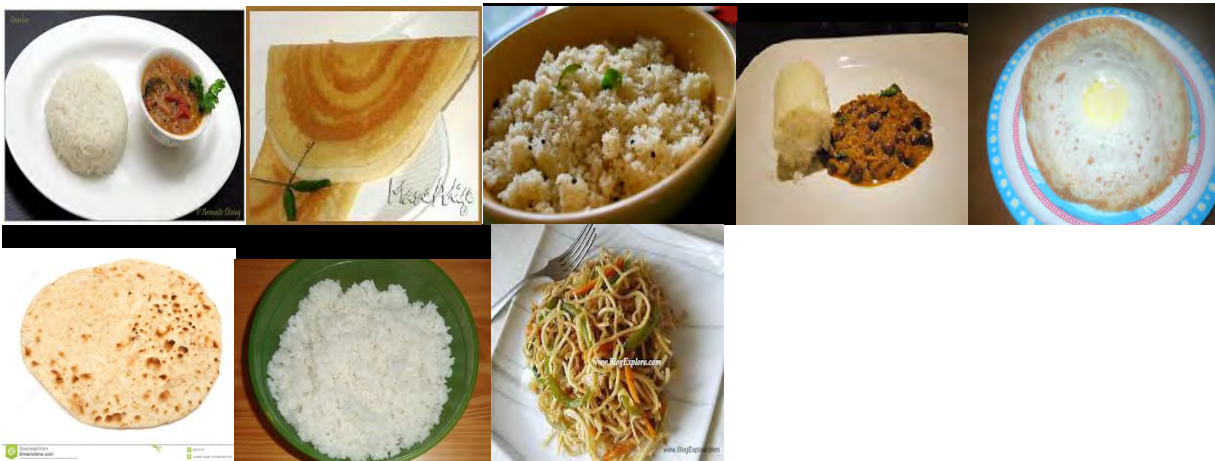


Any ONE seasonal fruit

FOOD EXCHANGES LIST

The dietician will give you a food exchange list. This list contains different foods of varying quantities but with the approximately same calories and nutrient content. The diabetes person can exchange for different foods within the same group. The food exchange list is given below.

Cereal exchange contains approximately 85 calories, 1-2gm proteins, 15-20 gm carbohydrates, nil fat



Milk Exchange contains 65 calories, 3.2 gm proteins, 4 gm fat, 4gm carbohydrates



Cow's milk 100ml



Buffalos milk 50ml



Curds 100ml

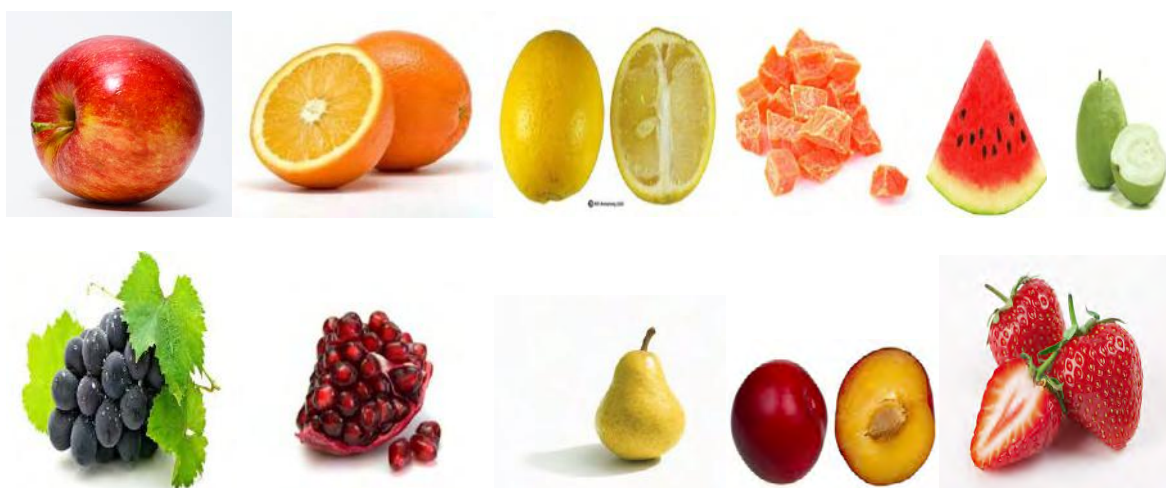
Pulse exchange contains approximately (1/2 cup =25gm),
Calories=85 cal, Proteins=4-6gms, Carbohydrates=12-15gm



Meat/Fish exchange contains approximately 85 calories, 6-9gms fats,
6-18gm proteins, nil carbohydrates.



Fruit exchange contains approximately 40 calories, 10gm
carbohydrates, nil proteins & fats



Carbohydrate counting

The amount of insulin required for each gram of carbohydrate eaten varies between individuals and your physician/dietitian will help you to assess your carbohydrates: insulin ratio. Hence by knowing the carbohydrate content of food stuffs, a person will be able to adjust insulin dose. On special occasions or when eating outside, counting the carbohydrates content of the food will help you to adjust the amount of insulin you need. This way you will be able to maintain your blood sugar levels within the normal range even during non-routine days. The list of foods given below contains 15gms of carbohydrates. The content may vary depending on the ingredients that are added in the preparation of the dish.

Carbohydrate Counting Food List

(Foods marked with an asterisk* contain fat)

Cereals: 15g Carb

1/3 cup white rice cooked
 1/3 cup brown rice cooked
 1/3 cup tamarind rice
 1/2 cup biryani/pulao*meat
 1/2 cup khichadi/khichri cooked
 1 mini uttapam, 4"
 2 tbsp tapioca uncooked
 1/2 cup wheat sprouted
 1/2 cup uppma (cooked)
 1 slice bread, white, wheat or whole grain
 1/2 roti (bajra, makai, jowar)
 1 Chapati, 6" diameter
 (25g/3tbsp - whole wheat flour)
 2 puris 5"

1 dosa approx. 10"diameter

1 small idli

2 mini rava idlis

Starchy Vegetables: 15 g carb

1/3 cup plantain green

1/2 cup potato sabji*

1 small potato boiled or baked

1/2 cup sweet potatoes

1/2 cup peas

1/2 cup corn

1/2 cup yam

1cup mixed veg(corn,peas)

Pulses/dals/beans/non-veg: 15 g Carb

½ cup cooked pulses- green
gram/kidney
beans/chickpeas/sambhar
¾ cup chicken noodle soup
1 ¼ cup chicken curry (chicken
has no carbohydrates)
1 ¼ cup chicken chettinad curry

Milk/yogurt: 15g Carb

350ml regular cow's milk
1 cup plain yogurt,
nonfat/regular

Fruits/Juices: 15g Carbs

1 small Apple
4 whole apricots (fresh)
1 small banana (4oz) or ½
medium
3 dates
2 med figs fresh/1 ½ dried figs
17 grapes
6 jambu
1 kiwi
¾ cup mandarin oranges
½ small mango(½ cup, medium
ripe)
1 small orange
1 cup papaya cubes

½ med passion fruit
½ large pear or 1 small
¾ C fresh pineapple
2 small plums/3 dried
plums(prunes)
1 med custard apple (seetaphal)

1 ¼ cup watermelon cubes

**Snack foods: 15g carb(1carb
choice)**

30gm bhelpuri
6 panipuri
2 papad
4 Marie Biscuits
3 cups popcorn
1 ½ cup puffed rice
½ cup sprouted pulses
10 French Fries*
½ cup cooked vegetables
(asparagus, green
beans, bean sprouts, beets,
broccoli, cabbage,
carrots, cauliflower, eggplant,
okra, onions,
spinach, tomato, turnips, and
zucchini etc.)
1 cup raw vegetable

MEAL PATTERN FOR PEOPLE WITH DIABETES

Breakfast

Idli/dosa/chapathi

Vegetable 1 cup

Pulses/sambhar - 1 serving

Milk 100ml

**Snack time: Milk 200ml/sprouts ½ cup/fruit/groundnuts/
vegetable salad**

Lunch



Rice

Veg 1 cup

Pulses/ Egg/fish/chicken - 1 serving

Curds

Tea Time

**Milk 200ml/sprouts ½ cup/fruit/groundnuts/ Arrowroot
biscuits/High fibre Digestive biscuits**

Dinner



Chapathi

Vegetable 1 cup

Pulses/ Egg/Fish/Chicken – 1 serving

Late night snack: Milk 200ml/ / Arrowroot biscuits/High fibre digestives

Tips for healthy living

- ✓ Eat at regular times
- ✓ Eat a balanced meal
- ✓ Avoid long gaps between meals
- ✓ Follow a 3 meal + 3 snacks eating pattern
- ✓ Include fibre rich foods in all the meals
- ✓ Take 4-5 serving of vegetables daily
- ✓ Drink adequate quantity of water (8-12 glasses of water)
- ✓ Exercise for 30 minutes daily.

Contact Us

810, Department of Endocrinology, Diabetes & Metabolism

Christian Medical College, Vellore

P.O. Box.3, Vellore 632 004, Tamil Nadu, South India.

Email: endocrine@cmcvellore.ac.in

Telephone: +91 416 2282528, +91 416 2282491

Telefax: +91-416- 4200844 / 4203570 / 2229927