

## *Diabetes Education Programme*

### **MANAGEMENT OF DIABETES : MEAL PLANS AND NUTRITION ( For people with diabetes and their families )**

*Khosla A*

Food is as essential for human existence as the air we breathe and the water we drink. The popular saying that "man must eat to live and not live to eat" should not be ignored, as one's physical status and well being depends upon the quality and quantity of food that one consumes every day. The food one chooses must be well balanced.

In the treatment of diabetics diet plans an important part. The basic purpose of a diet plan is to provide the body :

- Optimum Nutrition.
- Keeping the blood glucose as normal as possible and
- Maintaining a desirable ideal body weight.

The diet modification should be such that it is genuinely acceptable and still meets the major therapeutic considerations. The essential components involved in diet planning are :

- i) *Calorie requirement:* The energy which we get from food is measured in terms of calories. Each individual's calorie requirement is dependent on the person's age, present weight, sex and activity. The recommended calorie requirement of a person with normal body weight is 25-30 Kcal/kg ideal body weight (1BW)

- For an overweight diabetic decrease 5 Kcal/Kg IBW, and if he/she is a sedentary worker decrease 10 Kcal /kg IBW
- For the underweight diabetic increase 5 K. cal/kg IBW, & if he/she is a heavy worker, increase 10 Kcal/kg IBW

The weight of a person is co-related to the height. For every 5 feet, a woman should weight 100 Ibs and a man-105 Ibs. and for next every inch increase in the height, add another 5 Ibs. Considering a 52 years old housewife—who is recently-diagnosed as diabetic and her height and weight are 5'4"/80 kg and her blood sugars, FBS-185 and PP-205; calorie requirement would be : IBW of the patient (height 5'4") should be:  $100 + 5 \times 4 = 120$  Ibs or 54 kg. As the patient is obese and a sedentary worker the total calorie requirement would be  $54 \times 20 = 1080$  Kcal/day.

ii) *Proper Meal timings* and meal distribution depends upon the kind of treatment i.e. on diet alone; or diet+oral hypoglycaemic drugs; or diet + insulin. Emphasis on meal timings is there to avoid hyperglycemia or hypoglycaemia. When on diet alone or diet -r OHA, the meals could be distributed in three major meals, though 5-6 meal pattern is better. For the person on insulin the meal timings and food have to be adjusted for the insulin action, eg.at the peak action of plain or

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lente insulin i.e. approximately 3 hours or 9 hours later respectively snack should be taken. For diabetics taking a combination of plain and lente insulin before break-fast and before inner the meal pattern should be 6 meals a day—Break-fast, mid morning snack, lunch, snack + tea, dinner and a bed time snacks. Repeated emphasis is required for in between snacks to avoid hyper or hypoglycaemia.

**1000 calories Reducing diet**

Food exchange	Breakfast	Lunc	Tea	Dinner
Cereal	2	2		2
Milk	1	1/2	1/4	
Legumes		1		1
Fruit			1	
Oil		1		1
Veg. A		1		
Veg. B				1

Carbohydrates-161 gm, Proteins-40, fats-22 gm.

**Carbohydrate distribution**

	Break fast 7.00 am	Mid Morning 10.00 am	Lunch 1.00pm	Tea 4.00 pm	Dinner 7.00 pm	Bed Time 10.00 pm
On Diet/Diet + OHA	1/3		1/3		1/3	
Diet + Insulin	2/9	2/9	2/9	1/9	2/9	1/9

iii) *Proper distribution of Calories*—The Total calories should be distributed in such a way that 65% of total calories are from Carbohydrates, 15% from proteins and 20% from fats. While planning a balanced diet-emphasis should not be on one or two food groups but a combination of all foods.

There are seven food groups/exchanges and the diet can easily be calculated on the basis of these. The seven food exchanges are listed in the exchange list. Within each exchange, one portion of a particular food is equal in calories carbohydrate, proteins & fat to another. Food in any one group can be substituted for foods within the same group, though the portion size may not be the same. But foods in one group usually cannot be traded for foods in another group. For best results you should do some measuring at first but will soon develop an 'eye\*' for how much a certain amount is. Though it is still wise to occasionally check your measuring ability.

While planning the meals with the help of food exchanges, you can take care of the overall health and control your diabetes better with proper food selection, especially by increasing the amount of fiber and decreasing cholesterol and saturated fats in your diet.

*Fiber* : is the part of whole grains, vegetable, fruits that is not digested or absorbed by your body. Various studies have shown that fiber helps in reducing blood glucose levels, helps in weight reduction, in lowering serum cholesterol and helps in digestive disorders. Therefore, the emphasis on complex carbohydrates in the diet. Some of the high fiber foods are : Buck wheat (kootu) Barley, ragi, whole cereals, whole pulses and legumes, grams, beans & leafy vegetables. Refined foods like maida, suji, arrowroot, sago, juices etc. should be avoided.

Various ways of increasing fiber in your meal plan are :

1. Use of whole wheat : gram : 3 : 1 for chapati is better than plain wheat chapatti.
2. Mix equal portions of rice and whole pulses for idli, dosa and khichri
3. Select whole wheat bread or soya bread instead of white bread.
4. Drink 6-8 glasses of fluid daily to help your body use fiber effectively.
5. Include more of uncooked salad, sprouted beans for your salad.

*Cholesterol & Saturated Fat:* in the diet & in the blood is linked with coronary heart disease. Because people with diabetes have a tendency towards heart disease, it is recommended to limit the amount of cholesterol and saturated fat in your diet. Therefore, 20% of total calories should come from oils & preferably from poly unsaturated oils like safflower, sunflower, corn or soya oil. Saturated fats are to be avoided as cooking medium, since some percentage of it is already present as invisible fat in protein foods of animal origin.

Various ways of decreasing cholesterol and saturated fats in the diet :-

1. The use poly unsaturated oils should also be restricted; to 1/2 kg per person per month.
2. Use skim or low fat milk & milk products.
3. Instead of butter, use cottage cheese or dried curd.
4. Decrease use of red meat. Instead use fish  
Chicken

5. Bake, broil, roast, boil or steam foods instead of frying them.

Another important item in the diet is the alcohol consumption. This should usually be restricted as it basically provides simple sugar, and with some oral hypoglycemic agents eg. sulphonylurea it causes flushing, dizziness and nausea etc.

So the main food items to be avoided are :

1. Sugar, honey, glucose, squashes, aerated soft drinks, sherbats.
2. Fried foods like puri, parantha, pakora, Dalmoth, mathri and deep fried vegetable
3. Dry fruits e.g. peanuts, almonds, cashewnuts, Kishmish etc.
4. Candies, sweets, pastries, cakes.
5. Alcoholic beverages

And the free foods are :

1. Salads-tomato, Lettuce, onion, cucumber, cabbage.
2. Plain clear soup; fresh lime and plain soda
3. Vinegar, ginger, pickles without oil.

This, then is how a diet plan works. As suggested, it is not a highly restricted diet which will prevent you from joining your family and friends in the joys of eating. Rather it is a plan which will allow you to eat most of the things you normally enjoy while at the same time be beneficial to your health.

## EXCHANGE LIST OF DIFFERENT FOOD GROUPS

### CEREAL EXCHANGE

Carbohydrates	—	15 g
Proteins	—	2 g
Calories	—	70 g
Chappati (20 g atta)	—	1
Cooked rice (75 g)	—	3 tbsp
Idli	—	1 medium
Bread (30 g)	—	1 Large Slice (4" x Six 0.4")
Corn flakes (20)	—	3 tbsp
Porridge (cooked (180): 3/4 cup)		
Marie Biscuits	—	3 #
Potato	—	65 gm

### MEAT EXCHANGE

Meat/Fish/Chicken

Proteins	—	7 g
Fats	—	5 g
Calories	—	70 Cals.
Egg	—	50 g. (one)
Mutton	—	30 g.
Chicken	—	30 g.
Fish	—	30 g.
Pork	—	30 g.
Sausage	—	20 g.
(links)		(2 cocktail)
Ham	—	20 g. 1 slice
Cheese	—	20 g. 1* cube
Cottage Cheese	—	40 g.
1" X 1 1/2 cube		

### MILK EXCHANGE

Carbohydrates	—	12 g.
Proteins	—	8 g.
Fats	—	7 g.
Calories	—	145
Milk (240 ml)	—	1 glass
(3% fats, D.M.S./Mother Dairy)		
	—	3* dia. cup top
		2" dia. Bottom 4J deep
Curds (250 ml)	—	2 bowls 3" dia H deep
Cottage cheese	—	30 g.
		2'X 3" XI" cube
Butter milk	—	750 ml.
		3 glasses
Skimmed milk powder (45 g)	—	2 tbsp.

### LEGUME EXCHANGE

Carbohydrates	—	15 g.
Proteins	—	5 g.
Calories	—	80
Moong	—	25 g. (raw wt)
		2 tb. „
Urad	—	25 g.
Arhar	—	25 g. „
Rajmah	—	25 g. „
Lobia	—	25 g. „
Bengal gram	—	25 g. „
Nuttrinuggets	—	15 g. 2 tbs

**TRUIT EXCHANGE**

Carbohydrates	— 10 g.
Calories	— 40
Orange	— 90 g. 1 medium
Pear	— 90 g. 1 medium
Apple	— 90 g. 1/2 large
Banana	— 40 g. 1/2 small
Mango	— 60 g. 1/2 small
Ber	— 70 g. 5-6 medium
Water melon	— 300 g. 1 large slice
Papaya	— 120 g. 1 medium slice
Grapes	— 55 g. 10 medium
Guava	— 80 g. 1 medium
Loquat	— 100 g. 4-5 Nos.
Tomato Juice	(240 ml) 1 glass
Apricots	— 85 g. 2 medium
Dates dry	— 10 g. 4-5 Nos.

**FAT/OIL/EXCHANGE**

Fats	5 g. 45 Calories
R-Oil-Safola, Soya, Peanut	
maize till	— 5 g. (1 tsp)
Dalda Rath	— 5 g. (1 tsp)
Cream (Med)	— 10 g. (2 tsp)
Butter	— 7 g. (1 tsp)

**VEGETABLE EXCHANGE****A Group :**

Carbohydrate	— 3 g.
Proteins	— 2 g.
Calories	— 20
Cabbage, spinach, cauliflower, mustard, greens, brinjal capsicum, lauki, torai	— 100 g.

**B Group :**

Carbohydrates	— 7 g.
Proteins	— 2 g.
Calories	— 36
Peas, beans, carrots, pumpkin, bhindi, onions, raddish	— 100 g.

**ROOT AND TUBERS**

Carbohydrates	— 5 g.
Calories	— 20
Potato, Sweet potato, Colocasia, Beet root, Yam	— 20 g.