# Dietary management of diabetes: a practical approach for primary care physicians in Nigeria

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## Introduction

Dietary management is considered to be one of the cornerstones of diabetes care and is based on the principle of healthy eating in the context of social, cultural and psychological influences on food choices. Along with increasing levels of physical activity, it should be the first step in the management of newly diagnosed patients with type 2 diabetes, and maintained as such.[1,2] However, a number of physicians lack practical knowledge of dietary management of diabetes,[3] so patients are often bombarded with all sorts of information that may be confusing and detrimental.

The goals of dietary management of diabetic patients are:[4]

- to help achieve and maintain good glucose, lipid, and blood pressure control;
- to prevent or slow the rate of development of chronic complications of diabetes;
- to address individual nutrition needs with respect to cultural preferences and willingness to change;
- to maintain the pleasure of eating by only limiting food choices when indicated by scientific evidence.

Although diet is certainly important, on its own it is unlikely in the long term to maintain good glycaemic control and prevent complications. It is, therefore, pertinent to discuss all the methods of treatment of diabetes as soon as diagnosis is made and inform the patient of the possibility of an eventual need for oral hypoglycaemic agents and insulin.

## Principles of dietary management of diabetes

1. All members of the healthcare team must have knowledge of nutrition so as to be able to educate people with diabetes about dietary measures.
2. To achieve ideal weight loss, an appropriate diet should be prescribed together with an exercise regimen.
3. Caloric restrictions should be moderate, yet provide balanced nutrition.
4. Regular meals should be taken, without binge eating. The diet should be based on traditional eating patterns, and how palatable and affordable the food is.
5. Animal fat, salt, and 'diabetic foods' should be avoided.
6. Simple sugars in foods and drinks should be avoided.
7. Patients should be encouraged to eat meals higher in complex carbohydrates (starches), fibre, vegetables, and fruit.
8. Simple, explained dietary instructions should be provided to patients.
9. Food quantities should be measured in volumes using available household items such as cups, or counted as number of fruits, number of slices of yam, or bread.
10. Limit alcohol consumption or avoid because it is calorie-dense.
11. Sweeteners are not essential but may be used.
12. Commercial diabetic diets and drinks are not essential and are unduly expensive.

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## Requirements from the food groups

1. **Carbohydrate**: should make up 50–60% of diet. About 1 g of carbohydrate provides 4 kcal of energy. It exerts the most influence on blood sugar.
2. **Protein:** this should constitute 15–25% of the diet. About 1 g of protein provides 4 kcal of energy.
3. **Fat:** this should constitute 15–25% of the diet. About 1 g of dietary fat provides 9 kcal of energy. Saturated, mono-unsaturated, and polyunsaturated fat should each make up one-third of the dietary fat.[2]
4. **Fruits:** these may contain simple sugars, but are high in antoxidants and vitamins.
5. **Vegetables:** these are high in fibre and (depending on preparation method) may also be high in vitamin and antioxidant content.
6. **Sodium:** 2400 mg/day is recommended. One level teaspoonful = 2000 mg.
7. **Alcohol:** advice is similar to those without diabetes, i.e. up to 3 units/day (males) and 2 units/day (females). If weight loss is needed, alcohol should be restricted.

## A practical approach

1. Measure the patient's weight and height, and calculate

the body mass index (BMI).
2. If overweight or obese, calculate the ideal body weight of the patient [height ($m^2$) x 22.5]
3. Calculate the amount of calories the patient requires per day. This depends on how active the patient is: very active = 35 kcal/kg ideal weight/day; active = 30 kcal/kg ideal weight/day; not active/sedentary = 25 kcal/kg ideal weight/day.
4. Calculate the amount of calories required per class of food per day: carbohydrate 50% of total; protein, 25% of total; fat, 15% of total; and fruits and vegetables, 10%.
5. Convert the above calculations into grammes: carbohydrate and fat divide by 4; fat divide by 9; fruits and vegetables – five portions of fruits per day.
6. Inform the patient about the estimated quantity of carbohydrate, protein, and fat to be taken daily and encourage the patient to plan balanced daily meals to provide the calculated amount of calories, based on food preferences and style of eating. For those who do not have access to local measures, teach them to use rough estimates such as 'one or two fistfull's of rice', one small wrap of 'eba', 'fufu', or pounded yam, one tablespoonful of vegetable oil, one-eighth of a whole chicken, and so on. The total amount of calories can be divided into the number of times the patient eats daily, for example three main meals and one or two snacks in between meals.

This system is, of course, suited to well-motivated patients with access to good dietary supply. Those with erratic food supply, either due to illness, a very busy/tight schedule or lack of food, should be encouraged to ensure whatever meal they have access to is as balanced as possible.

## Estimated weights of standard measures of food

The following are useful for patients to estimate weights of food:

- rice: 1 level cup = 100 g
- beans: 1 level cup = 150 g
- yam: 1 slice = 200 g
- bread: 1 slice = 50 g
- potatoes: 1 medium size = 50 g
- plantain: 1 medium size = 150 g
- margarine: 1 tablespoonful (heaped) = 100 g

## Important dietary tips

- Individualise the diet for each patient.
- If a patient prefers a particular food, use more of that and less from another class of food for that meal.
- Use locally available foods and culturally acceptable measures where available.
- Encourage patients to use healthy cooking methods such as boiling or grilling instead of frying.
- Teach the patient how to adapt the calculated caloric requirement (measured in grammes). For example, 'for a meal of rice for lunch, cook 3/4 cup rice, 1 cup beans, 2 medium-sized pieces of fish, 1 medium-sized orange and two portions of spinach leaves.'

## A practical example

A 27-year-old active Nigerian student with type 2 diabetes (weight = 108 kg, height = 1.68 m).

1. BMI = 38.3 kg/$m^2$.
2. Ideal body weight = (1.68 x 1.68) x 22.5 = 63.5 kg.
3. Amount of calories required per day for the active student = 30 kcal x ideal body weight = 30 x 63.5 = 1905 kcal/day.
4. Convert calculated calories to grammes:
   - carbohydrate (50%): 952.5 kcal divided by 4 = 240 g.
   - protein (25%): 476.3 kcal divided by 4 = 120 g
   - fat(15%): 285.8 kcal divided by 9 = 32 g
   - fruits/vegetables: 1 portion of fruit and 1–2 portions of vegetable per meal.

## Conclusion

Primary care physicians are encouraged to make positive efforts to offer dietary management to their diabetic patients, especially when access to a licensed dietician is difficult. According to a Chinese proverb, the journey of a thousand miles begins with a step. Take a first step today in improving dietetic care in diabetic patients.

**References**

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