

# Diabetes & Kidney Failure: What You Need to Know About Protein

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Diabetes, if not properly controlled, can lead to a host of diseases including kidney failure. According to a report from the National Registry of Diseases Office, more than half (63.5% to be exact) of all newly diagnosed cases of end stage kidney failure in 2013 were due to diabetes<sup>1</sup>. The nutritional advice for kidney failure is complicated, and in addition to the nutrition advice given for diabetes, may seem almost unmanageable from a practical diet viewpoint.

The key nutrients of concern in kidney failure vary, depending on the stage of kidney failure and whether dialysis has been initiated. These nutrients are protein, sodium, potassium, phosphate, calcium and iron, as well as total calories and fluid.

Protein is particularly important in both pre-dialysis (to prolong the functioning capacity of the kidneys) as well as post-dialysis (to ensure adequate nutrition and preservation of lean muscle mass) stages.

Diabetic patients with kidney failure will need to go on a low protein diet pre-dialysis as protein puts additional strain on the kidneys to process, but increase protein intake once dialysis is initiated as the process of dialysis tends to 'wash out' protein from the body. Your dietitian will advise you on how much protein you should be taking in a day. It is important though to be able to estimate protein portions visually in order to ensure that you consume the right amount of protein.

Before learning about how to estimate protein portion sizes, it is important to understand the main sources of protein in foods, and the difference in the quality of protein across different food groups. Protein is found mainly in meat (e.g. chicken), fish, eggs, dairy foods (e.g. milk), beans, nuts and seeds. They are also found in smaller quantities in grain foods, e.g. bread, rice as well as in fruits and vegetables.

Protein from animal sources are generally more complete and are of a higher quality than from plant sources, with the exception of soya bean and its products. As such, you should be consuming the majority of your protein from animal sources and soy, particularly if you are required to restrict your protein intake. Taking adequate amounts of high quality protein is essentially to preserving lean muscle mass as well as building one's immunity.

## Suggested meal plan for a patient on a 50g protein a day diet

### Breakfast

2 slices of wholemeal bread with an egg  
+ 1 cup of tea with a teaspoon of sugar

### Lunch

A bowl of sliced fish noodle soup (sliced fish equivalent fo 2 matchboxes) with 1 serving of vegetables (3/4 cup of kalia) + 1 serving of fruit (1 apple)

### Dinner

A bowl of mixed white and brown rice  
+ ½ square of hard tofu  
+ 1 chicken wing with 1 serving of vegetables (3/4 cup of stir-fried carrots with broccoli)  
+ 1 serving of fruit (1 orange)

There are several methods for estimating protein portion size. However the simplest method would be one that was developed at National University Hospital Singapore and tested out on a local population, known as "Expedited 10g Protein" or EP-10<sup>2</sup>. Basically, it uses a protein exchange of a food which is high in protein, e.g., meat, fish, eggs to incorporate protein from other food sources which are naturally low in protein such as rice, vegetables, assuming that one takes a balanced diet consisting of all the basic food groups. So, for example, if a patient is restricted to having '50 grams of protein' per day, she would have to limit her protein intake to '5 protein exchanges' in a day. Table 1 below lists the protein exchange equivalent of various foods:

**Table 1: Equivalent of One exchange of Expedited 10g Protein (EP-10)**

Food Item	Cooked Weight	Measurement
Meat/ Poultry/ Fish	30g	1/3 palm size or size of 1 matchbox
Chicken Wing	45g	1
Canned Tuna Flakes	30g	2 tablespoons
Prawns/Shellfish	30g	4 medium pieces
Fishball or Squidball	50g	4-5
Crabsticks	70g	4
Egg, whole	50g	1
Egg whites	50g	2
Chicken Essence	70g	1 bottle
Corn on the Cob	250g	1 big
Corn Kernels/Sweet Corn	200g	1.5 Cups
Peas, fresh or canned	100g	¾ Cup
Cow's/Goat's Milk	200ml	1 glass
Yoghurt Drink	200ml	1 glass
Soya bean milk	300ml	1.5 glass
Milo (ready to drink)	400ml	2 glasses, 1.5 packet
Yoghurt drink (Yakult, Vitagen)	200ml	2 bottles
Evaporated Milk	90ml	6 tablespoons
Cheese Slice	30g	1 slice
Yoghurt	125g	½ Cup
Milk Powder	30g	4 tablespoons
Milo 3-in-1	90g	3 sachets
Beancurd/Tofu (hard)	60g	½ square
Baked beans (drained)	140g	3 heaped tablespoons
Cooked Lentils/Beans (dhal, mung bean, red bean, green bean, kidney bean, soybean)	90g	3 tablespoons
Dry Lentils (uncooked)	30g	2 tablespoons
Gluten/Mock Meat	50g	1/3 Cup
Soyabean Curd in Syrup	100g	½ Cup
Lotus Seeds	80g	1/3 Cup
Gingko Nuts	162g	1 Cup
Peanuts (Unshelled)	35g	4 tablespoons
Almonds/Peanuts/Other Nuts	30g	2 heaped tablespoons
Peanut Butter	30g	2 tablespoons
Cake	100g	1 slice
Custard/Milk-based Desserts	130g	½ Cup

#### References

1. <https://www.nrdo.gov.sg/docs/librariesprovider3/default-document-library/trends-in-chronic-kidney-failure-in-singapore-2012-2013-web.pdf?sfvrsn=0> Accessed on 22 May 2016
2. Lim SL, Lye J, Liang S, Miller M, Chong YS. Development and validation of an expedited 10g protein counter (EP-10) for dietary protein intake quantification. *J. Ren Nutr.* 2012. <http://www.ncbi.nlm.nih.gov/pubmed/22226755>. Accessed on 23 May 2016