

Nutrition after a kidney transplant (Engelse vertaling)

A healthy diet after a kidney transplant is important to maintain your health and to support your recovery after surgery. If the transplanted kidney works sufficiently, all of the dietary restrictions that were of previously advised before the transplant will no longer be valid necessary. All the toxins will exit the body by means of urination. This means that a 'normal' diet will come into effect, which is the same for any other healthy adult.

If the transplanted kidney does not work sufficiently enough, some dietary restrictions will remain necessary. This will be determined by your lab results and blood pressure.

Healthy diet

Our nutrition is based upon the following nutrients: protein, fats, carbohydrates, fibers, vitamins, minerals and water. A healthy and varied diet will ensure you receive a sufficient amount of these nutrients. Because these nutrients aren't available in every product, it is necessary to have a varied diet. The table below shows the average of what an adult needs throughout one day.

Product	19 to 50 years of age	51 to 69 years of age	Above 70
Vegetables	250 grams	250 grams	250 grams
Fruits	2 servings	2 servings	2 servings
Bread	4-8 slices	3-7 slices	3-6 slices
Whole wheat grain products or small potatoes	4-5 serving spoons	3-4 serving spoons	3-6 serving spoons
Meat, fish, poultry, legumes, egg*	1 portion	1 portion	1 portion
Unsalted nuts	25 grams	25 grams	25 grams
Dairy products	2-3 servings	3-4 servings	4 servings
Cheese	40 grams	40 grams	40 grams
Butter, margarines and oils	40-65 grams	40-65 grams	35-55 grams

*Choose fish once a week, preferably a fatty fish

Fluids

Drink 2-3 liters of fluids a day. Choose fluids which are low in calories, such as (mineral)water, coffee and tea without sugar (if desired, sweetener may be added) and diet soda.

Proteins

Proteins are important for recovery after a kidney transplant. They help build up and maintain muscle mass, support the healing process and help maintain your physical abilities. For this reason it is important to increase your protein intake during the first 4-6 weeks after transplantation. After 4-6 weeks you can gradually go back to the recommend amount of proteins which is recommended by World Health Organization (WHO).

The following products are high in proteins:

- Meats, fish, poultry and meat substitutes;
- Dairy products such as milk, yoghurt and cheese, or soy substitutes;
- Eggs;
- Legumes such as beans, green peas and lentils;
- Nuts

If the transplanted kidney doesn't function properly, a nutrition which is lower in protein is recommended. Please wait for further instruction from the dietitian.

Energy, calories and body weight

In the first year after a kidney transplant a lot of people gain about 10 kg of (unwanted) weight. This can be explained due to feeling insecure to exercise, the increased feeling of welfare after dietary restrictions are no longer necessary and also from an increase in appetite. Another factor could also be attributed to Prednisone, a medicine that is known to stimulate appetite. If you eat more calories than your body needs, you will gain weight which can lead to being overweight. Being overweight increases your chances of cardiovascular diseases, hypertension and diabetes.

9 tips to maintain your body weight

1. Avoid eating excessive unhealthy fats by reducing the use of butter and restricting intake of deep-fried products and fast food.
2. Choose lean cuts or deli cuts for sandwiches, for instance chicken or turkey. Try cheese which is lower in fats, like the 20+/30+, cottage cheese or Swiss cheese instead of the 48+ cheese, which is a full fat cheese.
3. For dinner, choose a lean kind of meat or poultry, like chicken- or turkey. Choose fish once or twice a week, preferably a fatty fish like salmon.
4. Choose skim or semi skim dairy products instead of full fat. Replace high-fat desserts such as ice-cream, cake, or pudding with a low fat variant, like fruit, low-fat puddings, sherbert or fruit-popsicles.
5. Restrict the use of fatty and sweet snacks like cake, cookies, candy, chocolate, bar mix nuts, crisps/potato-chips, sausage or cheese. Instead go for a piece of fruit, a handful of unsalted nuts (almonds/walnuts) or a sandwich/cracker with lean cuts or deli cuts if you are feeling hungry.
6. Don't use sugar in your tea or coffee, or replace it with artificial sweeteners.

7. Choose mineral water or diet soda instead of regular soda. Restrict the use of fruit juices, because these contain excessive amounts of sugar and calories. Be careful with alcohol. It is preferred not to use alcohol or to restrict it to a maximum of 1 glass of alcohol per day.
8. Choose food which is high in fiber, like vegetables, fruits and wholegrain bread.
9. Get enough exercise. This means at least 150 minutes (two and a half hours) a week of low intensity workouts, like biking or walking. And exercise with weights at least two times a week, to promote the development of muscle and bone-mass. Try to avoid sitting still for an extended period of time.

Fats, cholesterol and triglycerides

Some medication, like cyclosporine, can elevate your cholesterol or triglyceride. An elevated cholesterol or triglyceride level can enhance your risk of cardiovascular diseases. By following the advice mentioned above, you can lower your cholesterol or triglyceride levels. Other recommendations include:

- Eat (fatty) fish instead of meat once or twice a week.
- Use oils, liquid margarine and/or liquid fats to cook with. Avoid hardened margarines, fats or butter.

Carbohydrates, elevated blood sugar levels and diabetes

The use of Prednisone can lead to elevated blood sugar levels and type 2 diabetes. To counteract the elevation of blood sugar, it is important to restrict the use of sugar and carbohydrates.

- Avoid consuming sweet drinks such as soda, lemonade and dairy products with added sugar. It is better to choose water or (unsweetened) tea. Diet soda, sugar free lemonade and diet dairy products are also a good choice.
- Don't drink too much (unsweetened) fruit juices. These drinks contain the same amount of sugar as a regular soda!
- Don't add sugar to coffee, tea and/or dairy. Make use of artificial sweeteners if a sweet taste is preferred.
- Limit the use of candy, cookies, cake, chocolate, ice-cream and desserts which are rich in sugars. Replace these products with fruit or an unsweetened dairy product.

Sodium and hypertension

The WHO advises to restrict your salt intake to a maximum of 6 grams a day. This amounts to 2400 mg of sodium. This recommendation does not only apply to kidney patients, but to all (healthy) adults. An excess of sodium results in a high blood pressure and the retention of fluids. A diet low in sodium will support your transplanted kidney.

A diet low in sodium is as follows:

- Ordinary bread;
- Unsalted (diet)margarine/halvarine;
- Lightly salted savory deli products or sweet toppings to put on bread, see the paragraph 'Tips' for examples;
- Semi skimmed milk and dairy products; with a maximum of 3 to 4 portions a day;
- Dinner prepared without any added salt and/or flavor enhancers like stock cubes, soy sauce, ketjap, Aromat and spice mixes;

- Snacks low in salt, like unsalted popcorn and unsalted nuts.

Tips:

- Don't use salt when preparing meals
- Don't use stock cubes, maggi, ketjap, sambal and mustard. Use fresh or dried herbs/spices to enhance the flavor of the meals. The use of low-sodium flavor enhancers is allowed. These are available at big supermarkets or health food stores. Beware: these products could be high in potassium. Before using these products, check with your doctor or dietitian if this is allowed.
- The use of vinegar, lemon juice, ginger, garlic, onion, fresh or dried herbs/spices, a herb bag, mustard powder and wine is allowed. You can enhance the flavor of meat, fish or poultry by preparing it with vegetables like tomato and/or mushrooms. It is possible to prepare a gravy or sauce with this, which you can thicken with cornstarch or potato starch
- Don't use salt products such as soups, ready-made or take away meals, fast-food, ready-made sauce or sauce made from sauce packets, salted meat or fish (raw ham, cured meat, sausages, salted herring, anchovy, sardines, bokkingboater), pretzels, salted nuts and potato chips.
- Licorice can elevate your blood pressure. This is caused by the substance glycyrrhizin, which can be found in both sweet and salty licorice.
- On the packaging of products you can find how much salt or sodium the product contains. To compare different products with each other you are able to choose the product which contains the lowest amount of sodium or salt. The Dutch word for sodium can be: Natrium/Na⁺. The Dutch words for salt can be: Natriumchloride/Zout.
- Beef cuts or deli products low in sodium: lean cuts like chicken or turkey, rolled roast, low-sodium cheese, cottage cheese, dairy spread, eggs, nut butters or peanut butter 100%, jam, apple syrup, honey, chocolate sprinkles, fruit, raw vegetables.

Use as much fresh produce as possible. For Dutch recipes you can use the book 'Eten en drinken als uw nieren niet goed meer werken' which is published by 'de Nierstichting' or browse the internet (for example: www.nvn.nl or www.nieren.nl). Furthermore, there are low-sodium cookbooks available such as "Lekker zonder zout" published by the Dutch society 'de Hartstichting'.

Calcium

Because the use of Prednisone can increase the chance of bone loss, it is important to ensure you are meeting the recommended daily intake of calcium. This is the reason why enough calcium in your daily food pattern is important. Dairy products and cheese are the most important sources of calcium in our nutrition and it is advised to take 3 to 4 dairy products a day. You can also choose calcium enriched products, like calcium fortified milk or plantbased substitutes. Besides the intake of calcium it is important to have enough exercise and vitamin D. Exercise stimulates the production of bone tissues. Vitamin D is necessary for the calcium absorption and is a building block for the bones. In terms of food products, halvarine, margarine, meat and fish are the best sources of vitamin D. Also the body itself can produce vitamin D with the help of sunlight.

Potassium

If the kidney transplant works sufficiently, it is not necessary to restrict your potassium intake by means of diet. Some medications (like cyclosporine, tacrolimus) can heighten the potassium

level in your blood. If this is the case, food low in potassium is advised. Your dietitian can provide you more information concerning potassium restriction.

Grapefruit (juice) and other citrus fruits

Grapefruit, mineola, orlando, pomelo, pompelmoes, sweetie, ugli and juice of these fruits are not allowed when you take certain medicine, like tacrolimus and ciclosporine. These fruits contain a certain substance that can influence the medicine level and can cause certain side effects. Consult with your doctor if you are in doubt which fruits you can eat. Eating other citric fruits, like orange, mandarins, lemons and limes is allowed.

Hygiene

After the kidney transplant you will have to take immune suppressant drugs to prevent rejection of the new kidney. Especially the first months after the kidney transplant you are more susceptible to (foodborne) illnesses because of the higher dose of these immunosuppressants. To prevent (foodborne) illnesses you can abide by the following hygiene rules:

- Wash your hands well with water and soap before and after contact with food, after a bathroom visit, after blowing your nose and after contact with pets or animals.
- Replace your kitchen towels and dishcloths daily with clean ones.
- Check the food packaging for the expiration date and the storage advice. Don't use any produce which has passed the expiration date. Store perishable products, like meat and chilled products as fast as possible in the refrigerator which has a temperature of at or below 4°C.
- Use clean kitchen equipment which is made of glass or plastic. Don't use wood.
- Avoid every contact between raw and cooked food during cooking, including through your hands and kitchen tools.
- Clean bowls, dishes, cutting boards, countertops on which or in which raw foods have been stored before you start using them again.
- Don't leave perishable food out of the refrigerator for too long during hot weather. For example, meat cuts during a summer barbeque.
- The temperature of the refrigerator should not be higher than 4°C.

Foodborne illnesses

Some products are not recommended during the first year after your kidney transplant, because you are more susceptible to foodborne illnesses. Appendix 1 shows a list of which products you must temporarily avoid, and which products are safe to eat. A few guidelines are:

- Heat chicken, egg and meat until it is thoroughly cooked.
- Always wash vegetables and fruits before use.
- Cover leftovers well and store them in the refrigerator for a maximum of two days. Heat these leftovers well before eating them.

Hepatitis E

Don't use the following products, because of the risk of causing Hepatitis E. These products are the following:

- Pâté and/or sausage made of liver;
- Insufficiently cooked pork, wild boar and deer.

Summary

- Try to maintain a healthy and varied diet
- Drink plenty of fluids
- Try to maintain a healthy weight
- Try to restrict the use of (animal) fat, with the exception of fish oils.
- Try to restrict the use of sugar
- Cook dinner without salt or salty seasoning.
- Try to restrict the use of salty snacks
- Use products which are rich in calcium
- Pay attention to hygiene when preparing food
- Avoid a number of food products during the first year after your kidney transplant

Allowed	Avoid
Well cooked meat or poultry	Insufficiently cooked meat or poultry
Well-cooked deli cuts/cold cuts: <ul style="list-style-type: none"> • Bologna • Cooked ham • Cooked sausages • Turkey or chicken fillet • Meatloaf • Deli cuts/cold cuts from a can, which have been pasteurized or sterilized 	Insufficiently cooked deli cuts/cold cuts: <ul style="list-style-type: none"> • Filet American - steak tartare • Roast beef, carpaccio • Fricandeau: larded and braised veal fillet • Raw ham, like serranoham, parmaham, ardennerham, schwarzwaldherham, iberico ham, prosciutto • Uncooked sausages like ossenworst, salami, chorizo, cervelaatworst • Smoked meats • Liver, liver sausage (liverwurst), liver pâté • Liver cheese (leberkäse) or ‘gebakken pastei’ • Brawn, black pudding, ‘likkepot’, ‘Gentse kop’ • All kinds of terrine which contain pork, swine or deer liver
Well-cooked fish: <ul style="list-style-type: none"> • All fish which has been fried, cooked or baked • Cooked or backed sea food • Mussels which have opened during preparation • Fish from a can or jar • Pickled herring 	Raw or insufficiently cooked fish <ul style="list-style-type: none"> • Fresh smoked salmon, fresh smoked mackerel or fresh smoked eel • (Vacuum) Packaged fish like salmon, mackerel, eel or surimi • Sushi with raw fish • Fresh herring
Hard boiled eggs or fried eggs where the egg yolk is cooked: Products in which raw eggs are used, but are heated or pasteurized after cooking, like: <ul style="list-style-type: none"> • Mayonnaise from a jar 	Raw eggs, or eggs where the egg yolk is runny: Product in which raw eggs are used and which are not heated or pasteurized, like: <ul style="list-style-type: none"> • Home-made mayonnaise

<ul style="list-style-type: none"> • Bavaois, mousse or tiramisu made of pasteurized egg whites OR pasteurized during preparation 	<ul style="list-style-type: none"> • Home-made bavaois, mousse, tiramisu, where raw egg whites, raw egg yolks or raw eggs are used
Pasteurized and sterilized dairy products	Raw dairy products
Soft and hard cheeses made of pasteurized milk: <ul style="list-style-type: none"> • Soft goats or sheep cheese made with pasteurized milk • Mozzarella made of pasteurized (buffalo)milk • All spreadable cheeses • All cream-cheeses • Soft cheeses with a bloomy rind like brie, camembert, port salut, Roquefort made with pasteurized milk. • All other cheeses 	Soft and hard cheeses made of unpasteurized/raw milk or au lait cru: <ul style="list-style-type: none"> • Soft goats or sheep cheese made of raw milk • Farmers cheese • Soft cheeses with a bloomy rind like brie, camembert, port salut, Roquefort made of raw milk.
Factory-packaged ice cream (all kinds)	Unpackaged ice cream, like ice cream from a parlor, soft ice cream or milkshake.
All vegetables which are washed and not damaged	All vegetables which are unwashed and damaged
All fruits, washed or pre-packaged	Grapefruits, pompelmoes, ugli
Washed <u>and</u> blanched sprouts	Unwashed and unblanched sprouts
Pre-packaged salads and salads which are freshly made on the day of purchase and consumption	Unpackaged salads and salads which are freshly made and stored in the fridge or cooling compartment
When eating out or at the residence of acquaintances, all the guidelines need to be followed and food may be kept warm for the maximum time limit of 1 hour	Vending machine, market stall or take away dishes
Probiotics, yoghurt and yoghurt drinks with probiotics like Yakult, Vifit, Actimel and Activia	

If you have any questions regarding this nutritional advice, please contact your dietitian.

Date:

Dietitian:

Tel. number: