

Why is the liver so important in nutrition?

The liver has many functions, with nutrition being one of the key roles. One of the most important functions of the liver is to break down food and convert it to energy when it is needed. Some of this excess energy is stored in the liver as glycogen. The liver releases glycogen to ensure the body has a constant supply of energy, especially in between meals. The liver also functions to produce bile to break down fat into tiny droplets that the body can absorb, the manufacturing of proteins to provide building blocks for cell and tissue growth and repair, and the storage of vitamins.

Given the vital role of nutrition in the liver, if the liver is damaged, metabolism can be affected and patients can quickly become malnourished. Not all patients will become malnourished, this can depend on the type and severity of your condition and the treatment you are receiving. It is important to monitor your weight. Malnutrition is associated with a deficiency of nutrients which causes an adverse effect on your body, function and outcome.

Signs of malnutrition?

- Unexpected weight loss
- Loss of appetite
- Loss of muscle bulk (especially in the face, upper arms, chest) and reduced muscle strength.

The aims of good nutrition are to:

- Provide nutrients in the balance to maintain a good nutritional status and prevent nutritional deficiencies
- Avoid unplanned weight loss (unless specified by your clinician)
- Maintain your muscle, strength and mobility
- Provide you with energy for daily activities and socialising
- Support you through your treatment, reduce hospital admissions and maximise your quality of life.

Combining good nutrition with exercise is key to maximising your health and well being and muscle function.

How can liver disease cause malnutrition?

Liver disease can increase your energy needs and you need to eat more than you normally would to prevent weight loss. The side effects of liver disease or treatments you are receiving may make you feel unwell and not want to eat. If you have ascites (fluid in the tummy), you may find you get full up quickly and unable to eat as much. If this is happening, healthy eating recommendations would need to be relaxed in favour of eating foods high in energy, fat and protein to maintain your weight.

Cirrhosis and malnutrition

Cirrhosis is the scarring of the liver, (becomes firm and knobbly). This scarring leads to loss of liver cells, which can result in reduced liver function. The cirrhotic liver may be unable to store as much glycogen, (energy) as a normal healthy liver. If you are not having regular meals and snacks, the glycogen reserve disappears very quickly. If there are no energy stores, the body will look to find another source of energy and break down muscle to fuel the body to keep going. This results in a loss of muscle and you may notice becoming weaker and losing weight. This can occur rapidly.

The aim is to avoid prolonged periods of fasting to reduce muscle wasting. You should try to:-

- ***Eat regular meals and snacks containing carbohydrate every 2–3 hours.*** All meals should be based on a source of carbohydrate, such as bread, potato, cereal, pasta, rice, noodles or couscous. Suitable snacks suggestions include: yoghurt, tea cake, scone, toast, cheese and crackers, chocolate bar cake, or a small sandwich. If you are away from home, try to take snacks with you.
- ***Have a bed time snack*** to reduce muscle wasting overnight. You should aim to have 50g carbohydrate, examples of suitable snacks include:-
 - Bowl of cereal and banana
 - 2 slices of toast and jam and a glass of milk
 - Slice of fruit cake and glass of milk
 - 4 biscuits and a glass of milk
 - 2 crumpets and a banana.

What if I am finding it difficult to eat?

If you are struggling with your appetite and food intake, try some of the suggestions below:-

- Try to eat small but frequent meals
- Avoid skipping meals and snacks, however small, every little helps
- Make the most of the times you want to eat and try to enjoy your food
- Avoid drinking with meals as this may fill you up and spoil your appetite
- Keep snacks by your bed
- If you don't feel like solid food try a nourishing drink, e.g. full fat milk, Horlicks, smoothie, milkshake
- Prepare meals in advance when you have more energy and make extra for the freezer
- If the smell of food is unappetising, consider cold foods
- Accept offers from friends and family to help with cooking and shopping
- A short walk or fresh air before a meal, may increase your appetite
- Consider ready meals, these can be just as nutritious
- Use meals on wheels services or home delivery services offering pre prepared meals
- Include convenience foods (such as tinned, dried or frozen foods) in your weekly shop as these will last longer e.g. longer-life milk, savoury snacks, plain biscuits, rice puddings, corned beef, baked beans, soups, tinned puddings and custard.

How can I gain weight?-

- Try to have 3 meals a day and snacks in between
- Ideas for snacks include: cheese and biscuits, scone, tea cake, yoghurt, biscuits, olives, cake, sausage roll, slice of pizza, cereal, mini dessert, spring roll or hummus and dip. Focus on foods you fancy
- Try to avoid filling yourself up with large servings of fruit, vegetables or salads as they do not provide much energy
- If you usually use low fat, low sugar 'diet' foods and drinks, switch to the non-diet ones (e.g. whole milk)
- Add ingredients such as cream, cheese, butter, olive oil, cream cheese, milk powder and lentils to foods like soups, stews, curries, scrambled eggs, vegetables, potatoes.
- Add honey, syrup and jams to porridge, milky puddings, or toast.
- Fortify your usual milk by whisking 4 tablespoons of skimmed milk powder into 1 pint of milk
- Focus on nourishing drinks. These can include: full fat or semi skimmed milk, malted drinks, such as Horlicks or Ovaltine made with milk, smoothies, fruit juice and full sugar fizzy drinks. Milk is a good source of energy and protein.
- Try to have a pudding after your main course or as an in-between meal snack, e.g. sponge and custard, cheesecake, ice cream and fruit, trifle or rice pudding
- You could try and make your own homemade milkshakes, using a mixture of cream, yoghurt, honey, blenderised fruit, ice cream and flavoured milkshakes powers
- Powdered nutritional supplements are available from chemists or supermarkets and may be useful, but can be expensive
- Please note, if you have diabetes, consult with your Dietitian/health care provider as some of the above suggestions may not be suitable.

If you are struggling with your appetite and losing weight unintentionally speak to your health care professional who can consider if you require a referral to a Dietitian. In some cases, prescribed oral nutritional supplements may be required. A Dietitian can assess and advise if these are required.

What about protein?

When your liver is not working properly, your body needs more protein than normal. Protein is often known as the building blocks for building and repairing body tissues. Eating too little protein, particularly for long periods of time, may lead to muscle weakness, frailty and slow recovery from illness or surgery. The goal is to eat approximately 1.2-1.5g protein per each kg body weight.

Good sources of protein include meat, fish, eggs, soy, tofu, beans, pulses, nuts and seeds and dairy foods such as milk, yoghurt and cheese. As a guide aim to have at least 25g protein with each of your 3 meals a day. Milky drinks, such as hot chocolate or ovaltine and milky puddings such as custard and rice pudding after or between meals will help boost your protein intake. The table below includes some examples of protein rich foods and ways to achieve a good protein intake.

Combining a good intake of protein with exercise is ideal for maintaining and building muscle and making you feel stronger.

How much protein is in your food?

Food	Average portions	Approximate protein content
Meat and Fish		
Chicken breast	1 breast fillet (30g)	42g
Bolognese sauce, made with extra lean minced beef	240g	31g
Lamb chop	1 chop (70g)	20g
Sausage, thick pork	2 sausages (80g)	10g
Bacon back, grilled	2 rashers (50g)	12g
Pork chop	1 chop (75g)	22g
Ham	1 thick slice (23g)	5g
Beef burger	1 burger (34g)	7g
Roast beef	2 thick slices (90g)	27g
Pork pie	Individual (75g)	7g
Sausage roll	1 medium (60g)	5g
Shepherds pie/cottage pie	Average portion 310g	20g
Chilli con carne (no rice)	Average portion (155g)	14g
Cornish pasty with beef	Medium (155g)	11g
Chicken curry (no rice)	Medium portion 260g	35g
Tinned sardines in oil	Small can (100g drained)	24g
Battered cod	1 fillet (180g)	25g
Fish fingers	3 (90g)	8g
Salmon steak	(100g)	25g
Smoked salmon	½ average pack (70g)	21g
Tinned tuna	1 can (100g)	25g
Prawn cocktail	88g	6g
Tinned mackerel	1 can (125g)	24g
Eggs and dairy foods		
Egg	1 medium (50g)	10g
Cheddar cheese	2 slices (40g)	10g
Yoghurt, whole, plain	1 pot (125g)	7g
Cottage cheese	½ pot (150g)	18g
High protein yoghurt, (e.g. Skyr, Arla Protein, Lindahl's Kvarg)	1 pot (150g)	14-21g

Milky puddings (rice pudding / custard)	1 pot (120g)	5g
Milk, semi-skimmed	250ml	9g
Milk on cereal	100ml	5g
Skimmed milk powder	4tbsp (36g)	13g
Plant based proteins		
Tofu	80g	19g
Quorn	100g	13g
Lentils	½ cup (100g cooked)	8g
Roasted peanuts	1 bag (50g)	13g
Nuts (almonds, cashew, brazil)	1 handful (25g)	6
Baked beans	1 small can (150g)	8g
Chickpeas	1 tablespoon (40g)	3g
Vegeburger	1 (60g)	9
Vegetable lasagne	1 portion (420g)	20g
Lentils – green	1 tablespoon (40g)	4g
Peas	1 portion (70g)	5g
Peanut butter	1 portion pack (25g)	6g
Grains and cereals		
Muesli/granola	½ cup (40g)	4g
Porridge (made with milk)	160g	9g
Weetabix	2 biscuits (40g)	5g
White/wholemeal bread	2 slices (70g)	6g
Seeded bread	2 medium slices (90g)	10g
Pasta (cooked)	1 cup (200g)	11g
Rice (boiled)	180g	5g
Bagel	1 plain	7g

- Average portion sizes taken from *The Foods Standards Agency Food Portion Sizes Book*.
- Please note protein contents of different brands of foods may vary.

Meal ideas to improve your protein intake

Breakfast Ideas			
MEAT	FISH	VEGETARIAN	VEGAN
1 scrambled egg with 2 slices of bacon	2 kipper fillets with bread and butter	Scrambled eggs on toast or porridge or cereal with fortified milk	Vegan peanut butter on toast
Lunch ideas			
MEAT	FISH	VEGETARIAN	VEGAN
Ham & cheese omelette or cold ham & cheese ploughman's or chicken sandwich	Sardines on toast or sandwiches: -smoked salmon & cream cheese -tuna mayonnaise -prawn cocktail	Cheese omelette or bean soup with grated cheese or cheese on toast or sandwiches: -egg mayonnaise -cheese and pickle	Baked beans & vegan cheese on toast or sandwiches: -hummous & carrot -vegan cheese -nut butter & banana
Dinner ideas			
MEAT	FISH	VEGETARIAN	VEGAN
Lamb hotpot with potatoes or beef casserole or spaghetti bolognese with grated cheese or sausage & mash with gravy or chicken pie & chips	Small fish and chips (takeaway) or fisherman's pie or tuna bake or fishcakes & peas	Vegetarian lasagne or macaroni cheese or cheese & tomato pizza	Vegan bean chilli & rice or vegan lentil dahl or tofu stir fry
Snack Ideas			
MEAT, FISH, VEGETARIAN			VEGAN
Cheese and crackers, scotch egg, (meat or vegetarian options), cocktail sausages, (meat or vegetarian options) yoghurt, custard, rice pudding, chocolate mousse, fruit posset.			Nut butter & rice cakes, vegan cheese & crackers, hummous & breadsticks, vegan ice-cream
Drinks			
MEAT, FISH, VEGETARIAN			VEGAN
Milky drinks: milkshakes, smoothie, coffee, hot chocolate, malted drinks.			Adapt with plant based milk

This information has been adapted from www.malnutritionpathway.co.uk/covid19 be largely derived from the Managing Malnutrition in COPD and Managing Malnutrition in the Community patient materials. If you are required to follow a reduced salt diet, it is recommended to limit some of the smoked and higher salt foods mentioned above.

What is the dietary advice for ascites (fluid retention)?

If you develop ascites, you can help reduce the build up of ascites by reducing the amount of salt in your diet. About 70% of our salt intake comes from processed or every day foods, such as bread, crisps, breakfast cereals and ready meals. Cooking from fresh where possible will help reduce your salt intake.

Foods high in salt include:-

- Cured meats including: bacon, ham, sausages, salami
- Cheese – is a good source of protein, but avoid every day
- Smoked meats and fish
- Salted crisps, pretzels and nuts, olives
- Stock cubes, gravy, ketchup, soy sauce, Bovril, Marmite
- Tinned or packet soups and tinned vegetables
- Ready meals – check the packaging label for the lower salt options.

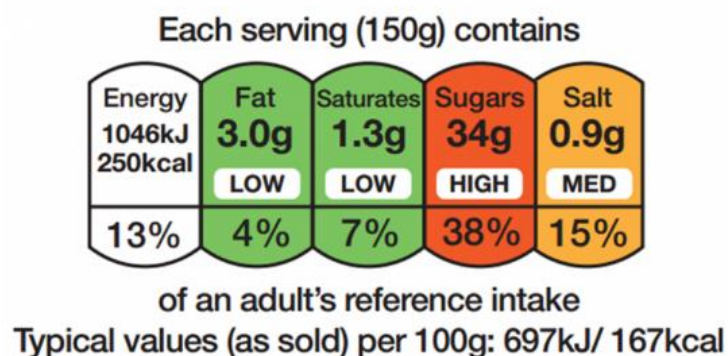
Try to reduce your intake of these foods or have smaller amounts.

Tips to reduce your salt intake:-

- Avoiding salt in cooking or at the table
- Gradually reduce your salt intake as your taste buds will adapt
- Choose unsalted snacks - crisps, nuts, popcorn
- Use herbs, spices, pepper, lemon for seasoning instead of salt.

It may be helpful to look at food labels as most food packaging has traffic light coding so you can tell whether a food has high, medium or low amounts of fat, saturated fat, sugars and salt. Try to avoid foods that are coloured red for salt. The salt content of some foods may surprise you.

If reducing your salt intake compromises your overall nutritional intake so you are losing weight unintentionally, this can be harmful. A balance is required, discuss this with your Dietitian.



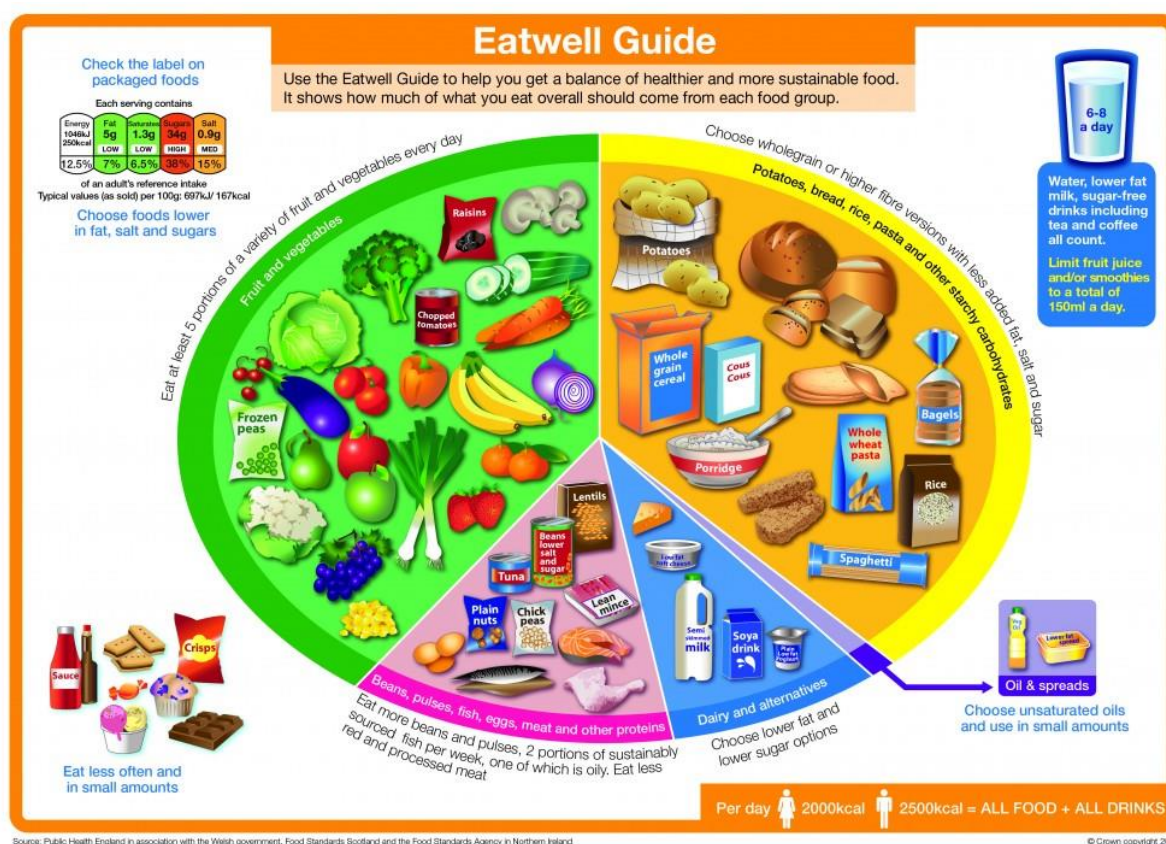
<https://www.food.gov.uk/safety-hygiene/check-the-label>

Healthy eating

It is important to remember that your body's nutritional needs vary depending on the type and severity of your condition. There may be enough healthy cells in your liver to perform all of its functions adequately and if your weight is in a healthy range and you are not losing weight, it is important to try to follow a balanced diet. If you have been told to lose weight, then it is important to do so slowly and safely.

Tips for a healthy balanced diet

The Eatwell plate below shows a pictorial version of a balanced diet and the proportions of each food group you should eat.



(Public Health England)

The Eatwell Plate is divided up into five food groups:-

- **Potatoes, bread, rice, pasta and other starchy carbohydrates** – include one of these foods with every meal. Try to include wholegrain or wholemeal varieties as this will increase the fibre in your diet.
- **Fruit and vegetables** – aim for 5 portions a day, (see figure below for portion sizes). These can be fresh, frozen or tinned. Try to incorporate a variety of colours. Fruit and vegetables are a good source of vitamins and minerals and fibre. If your appetite and food intake are poor, try not to fill yourself up with these foods. If you are struggling to manage 5 portions, you could consider taking a general multivitamin tablet.

- **Dairy and alternatives, such as milk, yoghurt, eggs and cheese** - are good source of calcium and important for strong bones, aim to consume three portions each day, e.g. 200mls glass of milk, a yoghurt or 30g of cheese. Choose lower fat options, such as semi skimmed milk, reduced fat spread and low fat yoghurts if excess weight is a problem. Ensure soya/oat/rice milks are fortified with calcium.
- **Beans, pulses, fish, eggs, meat and other proteins** – important for tissue regrowth and repair
- **High calorie foods, such as high fat and sugary foods**- should only be eaten in very small quantities unless you need to gain weight. Try to avoid frying foods where possible and reduce cake, biscuit, pastries and sweet consumption. Choose diet, low or reduced fat/sugar options where possible. However if you need to gain weight, eating more of these foods is beneficial and ensure you avoid diet options.



1 medium apple



2 broccoli florets



2 halves of canned peaches



1 handful of grapes



1 medium banana



3 heaped tablespoons of peas



1 medium glass of orange juice



7 strawberries



3 whole dried apricots



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(fruit & veg)

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3 heaped tablespoons of cooked kidney beans



16 okra

NHS

Supporting information

British Dietetic Association: www.bda.uk.com/foodfacts

Food Standard Agency: www.food.gov.uk

NHS www.nhs.uk/live-well/eat-well

Part of this information has been adapted from www.malnutritionpathway.co.uk/covid19 be largely derived from the Managing Malnutrition in COPD and Managing Malnutrition in the Community patient materials. --- Protein section.