Diet

Fact Sheet

Multiple Sclerosis Trust

MS

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Diet

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1. Introduction

This factsheet summarises and reviews the current evidence about diet in multiple sclerosis. It explores what constitutes a healthy diet, the role of diet in managing symptoms, and examines the evidence for some of the diets that have been promoted specifically for managing or even improving MS.

Research into diet and multiple sclerosis has been limited. However in a condition where conventional treatments are often only partially effective studies suggest that 50% to 75% of people do use dietary regimens and supplements.

The role of diet in helping people with problems such as eating difficulties, weight loss and constipation, as well as minimising risk for conditions secondary to disability, such as obesity and heart disease is now generally accepted.

However whether it is possible to influence multiple sclerosis itself through diet or dietary supplements remains a controversial topic. For those who prefer to use only absolutely proven treatments, then there's no diet or supplement to use. For those interested in low risk, possibly effective approaches, then a few of the well-studied options are explored.

Making changes to your diet to manage MS is best approached on a try it and see basis. Having considered cost, convenience and, in the case of exclusion diets, how to maintain the correct nutritional balance, you can try adding or removing something from your diet and monitoring to see if it has any effect on your own MS. See: **Useful Resources -** MS and me: a guide to self-management.

2. Why is diet important in MS?

For many people with MS diet offers a sense of control when living with a condition which is often unpredictable. Diet is a key to active self-management, promoting good general health and wellbeing which may be even more important following a diagnosis of multiple sclerosis.

Good diet can also play an important role in managing symptoms such as fatigue and constipation whilst a poor diet can result in a worsening of some symptoms, for example, weakness.

3. Does diet play a role in the development or course of MS?

This question has been asked for many years with dietary factors suggested both as a cause of MS and as a potential influence on the course it might take.

Studies have shown that the risk of MS is greater in countries where there is a high consumption of saturated (animal) fat. However, studies of the population as a whole in these countries have not shown that eating a diet high in saturated fat causes someone to develop MS[1]. Conversely, no study has found that eating more fruit and vegetables protects against developing MS.

Currently 50-75% of people with MS make use of special diets and dietary supplements, such as polyunsaturated fatty acids (PUFA), oils, vitamins and minerals [2, 3, 4]. However, research into diet and MS has been limited and the interpretation of nutritional research is very complicated. Research on fat intake may be complicated by other nutrients in the diet or by other environmental variants. Changing one nutrient in a diet always causes parallel changes in other nutrient levels and that could affect results.

People who follow a very low fat diet in long-term studies may also have a different disease pattern to those who don't manage to cope with a strict regime. While many scientists and many people with MS do believe that there is good evidence to show that people with MS would benefit from a diet low in animal fat, there are just as many who feel that this is not proven.

To try to understand what role diet might play in MS the Cochrane Collaboration has carried out an extensive review of the results of previous high quality research to see if any clear evidence exists[5]. The researchers aimed to:

- review how effective and safe the diets were
- see whether changes in diet helped MS
- look at any side effects of changes in diet
- examine any interactions between changes in diet and treatments for MS symptoms.

Only six studies, all of which examined polyunsaturated fatty acids (PUFA), met the criteria for inclusion in this review. There were no studies of vitamins or antioxidant supplements that could be included and no papers on any other proposed dietary intervention for MS. The authors found that the data available was not sufficient to assess any potential benefit or harm that might result from supplementation with PUFA although these may tend to reduce relapse frequency over two years.

It was not possible to draw any conclusions about how safe the dietary changes were. Overall, the quality of the trials was poor. None of the trials of vitamin supplementation or allergen free diets met the criteria for inclusion in the analysis and, despite the careful analysis, the authors found no strong evidence that changes in diet can make a difference in MS.

4. What is a good diet for MS?

Although research into diet and MS has been limited there has been research into a healthy diet for other conditions, such as cardiovascular disease[6]. This found that a diet low in fat, with lots of fruit and vegetables, reduced a person's risk of developing heart disease, stroke and certain cancers. Consequently this forms the basis for the Government's advice for a healthy balanced diet.

A balanced diet is essential to provide all the nutrients needed to be as active and healthy as possible. This includes foods from the major food groups of fruit and vegetables, carbohydrates, fat, protein and dairy products.

4.1 Fruit and vegetables

It was the World Health Organization (WHO) in 1991 that first advised an adult daily consumption of 400g fruit and vegetables, equating to about five portions of 80g each[7]. In 2001 the Department of Health translated this recommendation into the 5 A DAY plan that many people are familiar with.

There is no specific research on the number of portions to maintain optimum health: many believe that five is not enough and other nations recommend more, for example, France advocates 10 portions a day.

What makes a portion?

Fruit	Dried fruit	Vegetable	Juice	Pulses & beans
1 medium banana	3 dried apricots	2 tablespoons of peas	1 glass of 100% fruit or vegetable juice. But you can only count juice as 1 portion a day, however much you drink	3 heaped tablespoons of baked beans, haricot beans, kidney beans, cannellini beans, butter beans or chick peas Remember that beans and pulses count, but only as 1 of the 5 portions, no matter how much you eat
3 tablespoons fruit salad	1 tablespoon of raisins	2 florets of broccoli		
2 satsumas	2 dried figs	1 cereal bowl of lettuce		
½ large grapefruit	4 dried apple rings	7 cherry tomatoes		

Source: DH 5 A DAY Portion Information 2003

4.2 Dietary fat and types of fat

There is still debate as to whether dietary fat influences both the risk of developing MS in the first place and the rate and severity of relapses once it is established. Unfortunately, as this type of research is very difficult to do, this is unlikely to be resolved for a long time.

Fat is a vital element in any diet because it contains concentrated calories or energy. Fats are made up of fatty acids. There are two kinds of fat:

- saturated fat - normally hard at room temperature. This is found in meat and animal fats (eg lard), and in dairy products such as butter and hard cheese.
- unsaturated fat - usually soft or liquid at room temperature. Found in margarine and in vegetable, seed and fish oils.

There are two types of unsaturated fat:

- monounsaturated - found in olive oil and avocado.
- polyunsaturated - found in vegetable oils such as sunflower oil, rapeseed oil, safflower oil and also in oily fish such as trout, salmon, herring, pilchards and sardines. Essential fatty acids are the building blocks of polyunsaturated fats. The body is unable to make polyunsaturated fatty acids itself so it is essential that they are consumed through the diet, hence they are also known as essential fatty acids.

Research has shown a link between a high intake of saturated fat and an increased risk of heart disease and certain cancers, suggesting that a diet that reduces the intake of saturated fat is desirable.

Polyunsaturated fats have been the focus of the majority of studies into diet and MS. Polyunsaturated fats are further divided into two forms: omega-3 essential fatty acids and omega-6 essential fatty acids. It is recommended that foods containing both types are included in the diet.

Omega-3 essential fatty acids are present in oily fish such as salmon and mackerel, which are also good sources of protein and vitamin D. Other sources include green leafy vegetables and linseed oil.

The main omega-6 essential fatty acid is linoleic acid. This is found in the oils of seeds and nuts, such as sunflower, safflower, soya, corn seeds and walnut oils.

The use of supplements of omega-3 and omega-6 has remained popular over the past decade. While a re-evaluation of earlier research by NICE in 2003

encouraged their use, the Cochrane review of 2012 concluded that there was presently no evidence of benefit[5]. Both omega-3 oils and omega-6 oils influence the inflammatory response in MS in complex ways that remain poorly understood, so further research in this field would be very welcome.

4.3 Dairy

Dairy products including milk, cheese, yoghurt and cream are a good source of calcium and vitamins A, B_{12} and D. All full-fat dairy products are a source of saturated fat and are rich in calories. To reduce intake of saturated fat, substituting full-fat milk for semi-skimmed and choosing low fat or polyunsaturated fat spreads is an option.

4.4 Protein

Protein is vital to enable the body to build and maintain amino acids, the fundamental building blocks of the human body. Protein is present in foods such as meat, fish, beans and cheese. The Government recommends two portions of protein a day. Foods containing protein can also be a source of saturated fat, but chicken and fish can be a lower fat option.

4.5 Carbohydrate

Starchy carbohydrates are vital for producing slow-release sugars, which provide energy, and are found in foods such as bread, cereals, potatoes, pasta and rice. It is recommended that carbohydrates should make up around a third of the daily diet. High-fibre carbohydrates, such as wholegrain cereals, wholemeal or fibre-fortified white bread, can help prevent and relieve constipation. Sugar in drinks and between meal treats can lead to dental decay and weight gain, if taken in excess.

4.6 Fluids

Adequate fluid intake is essential to prevent dehydration. Too little fluid can increase the risk of urine infections, tiredness, headaches and constipation, and thus worsen existing MS symptoms. Recommended guidelines are one and a half to two litres, or eight to ten glasses, of fluid a day.

5. Food allergy and intolerance

There is no evidence that MS is related to food allergy or intolerance[8] but just because you have MS doesn't mean you can't have this or other conditions. Your GP can refer you to an NHS allergy clinic if this is suspected.

6. Diet and managing symptoms

6.1 Bladder

Some people with MS restrict the amount of fluid they drink as they are concerned about bladder problems. However, too little fluid can increase the risk of urine infections. Caffeine can irritate the bladder as can alcoholic drinks. See: **Sources of Help and Support**: Managing your bladder,

6.2 Constipation

Many people with MS experience bowel problems and although it is not fully understood how and why constipation happens in MS, a diet that doesn't contain sufficient fibre is one of the contributing factors that has been identified[9]. Constipation can also affect other symptoms of MS for example spasticity and spasms may be made worse and bladder symptoms aggravated. See: **Sources of Help and Support**: Managing your bowel and Spasticity trigger diary**.**

6.3 Fatigue

A healthy, well balanced diet with plenty of fruit and vegetables plus complex carbohydrates is required to provide optimum energy levels. A poor diet can leave the body lacking in the fuel needed to get through the day.

Although food and drinks high in sugar give an initial boost, blood glucose levels quickly drop again leaving energy levels low. High sugar foods and drinks are often low in nutrients, and the extra calories can cause unwanted weight gain.

Foods release carbohydrate at different rates and the Glycaemic Index (GI) is a ranking of carbohydrate-containing foods based on the overall effect on blood glucose levels. Slowly absorbed foods have a low GI rating, while foods that are more quickly absorbed have a higher rating[10]. Meals and snacks

which are rich in complex carbohydrates, such as fresh fruit and multigrain bread, have a low Glycaemic Index, giving a slower, more sustained energy release. Lactose, the sugar found in milk and milk products such as yoghurt, also has a low glycaemic index. Taking a low-GI food at the same time as a high-GI food can slow down the rate of release of carbohydrate, for instance a glass of milk with a sweet biscuit.

It is also very important in managing fatigue to drink sufficient fluids, especially water, as even mild dehydration can cause tiredness.

It can be helpful to think about ways to reduce the impact of fatigue when preparing and eating meals.

Preparing food

- Organise the kitchen to keep commonly used items close to hand.
- Keep the kitchen as cool as possible.
- Cook at times of day when energy levels are higher.
- Cook in bulk when you feel less fatigued and freeze for use at a later date.
- Sit rather than stand to prepare and cook meals.
- Get all the ingredients and utensils together before starting to cook.
- Make use of equipment or labour-saving devices where possible, such as electric mixers, can openers and knives.
- Use ready-prepared foods such as grated cheese, diced meat, pre-washed salads to reduce the energy required in preparing these foods.
- Frozen fruit and vegetables are as high in vitamins as fresh.
- Use wire baskets in pans rather lifting heavy pans.
- Microwave cooking avoids having to lift heavy pans and does not heat up the kitchen.
- Invest in a one-pot cookery book to save on washing up.
- A trolley is useful to avoid extra walking and carrying in the kitchen and when serving.
- Soak dishes rather than washing up straight away.
- Consider a meals delivery service (help may be available from Social Services).

Eating meals

- Large meals can leave people feeling bloated and sluggish. If this is the case then try having more frequent, lighter meals or healthy between-meal snacks such as fresh fruit, cereals or sandwiches.
- Try to eat main meals when energy levels are higher.
- Don't miss out on breakfast to provide energy and nutrients in the morning. If the first meal of the day is lunch, then the body may have gone 16 hours or more without food.
- When fatigue is a problem it can be easy to rely on ready prepared and snack foods. Try keeping the ingredients for easy to prepare healthy snacks or meals ready for use, such as beans on wholemeal toast or jacket potato and tuna for the microwave.
- Convenience foods can help at times when a healthier approach is not possible. Be aware that many convenience foods are high in fat and salt. Look out for healthy eating options and add extra vegetables or salad.

See: **Useful Resources** Living with Fatigue: a guide for people with MS

7. Managing weight

7.1 Weight gain

Weight gain is common with MS and may result from loss of mobility, side effects of medication and reduced exercise. Studies suggest that over 50% of people with relapsing remitting MS are overweight or obese[2].Weight gain can also affect the emotions and can result in loss of self-esteem and confidence in addition to making mobility problems more difficult to manage.

A low fat diet, using small amounts of vegetable oils in preference to animal fats, can reduce the risk of obesity and heart disease, especially if activity levels are also low. Talking to a dietitian can help and a GP can refer. GPs can also refer to a physiotherapist who can put together an appropriate programme of exercises. See: **Useful Resources** Exercises and MS www.mstrust.org.uk/exercises and Move it for MS.

7.2 Weight loss

Weight loss can also occur in MS where decreased appetite may result from depression and cognitive impairment, fatigue or relapse. Difficulty with swallowing can make it a challenge to get enough energy and nutrients from food. Some medication can also have appetite suppressive side-effects.

Weight loss can result in the risk of pressure sores and malnutrition. Malnutrition can diminish immunity to other conditions, affect mental functioning and reduce muscle strength.

Where weight loss is a problem, food with a higher fat content needs to be included in the diet and guidance from a dietitian may be helpful.

Weight loss may also be an indication of other conditions and rapid weight loss should be investigated with some urgency.

8. The role of diet in preventing other conditions

8.1 Osteoporosis

Osteoporosis is a condition where bones become thinner, more fragile and are more likely to break. Much of the general population is at risk of osteoporosis and as people age this risk increases. People with MS may be particularly susceptible to weaker bones because of immobility and certain prescribed treatments such as steroid drugs and antidepressants[11]. Balance problems and fatigue can increase the risk of falls and subsequent fractures.

Osteoporosis is also associated with an inadequate intake of vitamin D and calcium. Healthy balanced eating is recommended, including dairy products and oily fish, along with maintaining a healthy weight and taking appropriate exercise. See: **Useful Resources** Move it for MS and Exercise and MS www.mstrust.org.uk/exercises.

8.2 Heart disease

Studies show conflicting results as to whether people with MS have a reduced risk of heart disease compared to persons without MS. More studies are needed to determine whether people with MS have different risks of having other long-term conditions than the general population but a good well balanced diet has been shown to reduce the risk of heart disease in the general population.

9. Specific diets suggested for MS

Many diets are promoted in terms of managing or even improving MS. The majority of these diets are exclusion diets. Exclusion diets suggest that you stop eating one food or several groups of foods. Other diets suggest that some foods are only eaten at certain times and not combined with other foods. These are explored below.

9.1 Swank diet

In 1948, Dr Roy Swank began treating people with MS with a very low fat diet because of the possible association between dietary fat and MS. Results were reported in 1970 and again in 1990. 144 people were followed for up to 34 years, with good results reported on the long-term level of disability. Those people who followed the diet strictly and were experiencing mild symptoms when they started the diet had slower disability progression than those who had not stuck strictly to the diet[12].

However, the design of this trial was flawed, in that there was no comparison group and there was no 'dummy' treatment, so the results are of limited significance. People who did not continue with the diet may have perceived no benefit from it because they were deteriorating. So, we cannot know whether the good results in some people with MS represent a genuine improvement due to the low fat diet whether they were less severely affected by MS than people who dropped out of the study, or whether the results occurred due to chance alone.

9.2 Best Bet diet

The Best Bet diet is a strict exclusion diet developed by Ashton Embry. It is based on the hypothesis that MS is caused by intact food proteins escaping from a leaky gut, which causes the immune system to malfunction. In 2006, a small trial of the Best Bet diet began recruiting at Ninewells Hospital in Dundee. However, no results have yet been published from this study. Anecdotal reports from people with MS suggest that the Best Bet diet works for some people, but does not work for others. There are concerns about how easy it is to achieve a balance of all the food groups whilst following this diet.

The diet recommends consuming large quantities of supplements, which can be expensive and which is not necessary with a normal balanced diet.

9.3 'Overcoming multiple sclerosis' diet

This specific dietary approach includes a plant-based wholefood diet plus seafood, with no saturated fat, as far as is practical. Also included are omega-3 fatty acid supplements (these make up about 30% of the composition of fish oil and 60% of flaxseed oil), 20g (20mls or 20 capsules) a day of flaxseed oil or fish oil, or the equivalent amount if fish. This diet could be low in calcium if few dairy foods are eaten and low in iron if red meat is avoided, without care to eat appropriate alternative foods that provide calcium and iron.

9.4 What to consider for any MS-specific diet

Any diet can be difficult to follow, and, before embarking on one, it is worth considering these points:

- have you been given balanced or evidence-based information about the diet, or does it only seem to be promoted by enthusiasts?
- will the diet be worse than the symptoms that it might alleviate - for example, will it stop you eating all the foods you enjoy, or make going out for meals or eating with family or friends difficult?
- does it make realistic claims for improvements in MS?
- will your diet still be balanced?
- how affordable is it?
- will cooking or preparing it be a problem?
- is it recommended by your GP or dietitian?

10. Dietary supplements

A number of relatively small studies have examined dietary intake in MS. Around 60% of people reported taking fish oil supplements and a similar proportion took multivitamins[3]. People were also taking a wide variety of vitamin and herbal supplements, such as ginkgo biloba, ginseng, St John's wort, evening primrose oil and valerian.

As yet there aren't any dietary supplements that have been shown to have a positive influence on MS and most people can get all the vitamins required from a balanced diet.

There is some concern about taking multiple preparations, especially if taken together with prescribed medication. Herbal supplements such as ginkgo biloba, St John's wort and ginseng are known to interact with common medications and may reduce their effectiveness or worsen side effects. It's important that your doctor and MS nurse are aware of any vitamin or herbal preparations you take.

10.1 Vitamin D

The role of vitamin D in both cause and prognosis of MS has received much interest, with research focusing on two areas:

- Whether lack of vitamin D contributes to the risk of developing MS.

Studies of the distribution of MS around the world show that it is generally more common the further you are from the equator. This suggests a link between lack of exposure to sunlight, consequent lack of vitamin D production and the development of MS[13].

- Whether low levels of vitamin D affect the number of relapses and the disease course.

There is some evidence that lower levels of vitamin D are associated with higher relapse rates and greater disability[14].

Vitamin D can be obtained in several ways. It is manufactured by the skin when it is exposed to sunlight and can be obtained in the diet or as supplements.

The best way to get vitamin D is summer sunlight. Although it is hard to generalise across the UK, sitting outside for 20 to 30 minutes without sunscreen in short sleeves at midday between May and September should be enough for fair-skinned people. However, it is important not to get red or burnt as this raises the risk of skin cancer. Between October and April the sunlight in the UK usually has too low a level of ultraviolet B (UVB) for vitamin D to be made.

Vitamin D is found in some foods including oily fish, such as salmon and sardines and in cod liver oil. Lower amounts are found in eggs, fortified fat spreads, breakfast cereals and in powdered milk. Vitamin D is not needed in the diet every day because the body stores any vitamin D that is not needed immediately for future use.

Many people can get all the vitamin D they need by eating a healthy balanced diet and by getting some sun. When sunlight levels are low, such as in the winter or in more northerly areas, obtaining vitamin D from the diet or as supplements becomes more important. This applies particularly to people with darker skin, pregnant women, children and older people.

For people with MS who have difficulty getting outdoors regularly or who suffer from heat-induced fatigue, who have dark skin or who cover up, supplements can be useful. See: **Useful Resources** Vitamin D factsheet.

10.2 Linoleic acid

Whilst the current NICE Guideline for the Clinical Management of MS[16] recommends linoleic acid for people with relapsing remitting MS as a treatment that may help to slow the disabling effects of MS, a subsequent review has cast doubt on the quality of the original research trials and called for further investigation in this area[5].

11. Sources of help and support

Dietitian

A dietitian is a therapist who assesses, diagnoses and treats diet and nutrition problems. Dietitians use their knowledge of food and nutrition to devise eating plans to help manage medical conditions, promote good health through healthy eating and educate individuals and groups on good nutritional habits. Dietitians often work as part of a wider multidisciplinary team and may also visit MS Therapy centres.

For people with MS who experience swallowing problems a dietitian can suggest types of food and ways of preparing food that makes them easier to swallow or refer people to a speech and language therapist.

Dietitian is a protected title and all dietitians must be appropriately trained and registered with the Health and Care Professions Council (HCPC).

Nutritionist

Unlike a dietitian, the title nutritionist is not currently a protected term and anyone in the UK can refer to themselves as a nutritionist without any formal qualifications. The Nutrition Society has a list of accredited courses and maintains a register of nutritionists.

12. Useful resources

From the MS Trust:

MS and me: a self-management guide to living with MS.

Managing your bladder: a guide for people living with MS.

Managing your bowel: a guide for people living with MS.

Living with fatigue: fatigue management for people with MS.

Vitamin D factsheet

Spasticity trigger diary

Exercise and MS www.mstrust.org.uk/exercises

Move it for MS – DVD

Additional Resources:

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NHS Choices www.nhs.uk/Livewell/healthy-eating/

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