

THE LIVER

and detoxification

Do you feel you could benefit from a detoxification programme? Looking specifically at the liver, Hannah Kaye examines the body's own inbuilt detox processes and ways to support them.



Food, alcohol, drugs, bacteria, viruses and the environment launch a daily assault on the body's inbuilt detoxification systems. These systems and their related detoxification functions include the skin (perspiration), the liver (filtration of blood, secretion of bile and enzymes), the intestines (mucosal detoxification, excretion of faeces) and the kidneys (excretion of urine). When the detoxification system is overwhelmed, disruption of homeostasis (the ability of the body to regulate its inner environment) will inevitably follow, leading to a wide array of symptoms.

SYMPTOMS

These include, but are certainly not limited to:

- fatigue, myalgia, headaches
- symptoms that are exacerbated on exposure to chemicals such as petrol or perfume
- adverse or paradoxical reactions to common drugs, herbs and vitamins
- adverse reactions to caffeine and alcohol
- feeling physically ill with increased stress or exercise
- sleep disturbances and forgetfulness
- chronic pain and inflammation
- compromised immunity
- fibromyalgia or chronic fatigue syndrome.

THE LIVER

Although the liver is not the only organ involved in detoxification, it will be the organ discussed predominantly in this article. This is because it is involved in all the most critical systems in the body, including the nervous, immune, endocrine, digestive and circulatory systems, and any weakness or debility in the liver impacts on every other organ system.

The liver is the second-largest organ in the body after the skin. In addition to its endless detoxification work, it performs many other functions. It processes the body's nutrients, manufactures bile to help digest fats, synthesises many proteins, and regulates blood clotting. It is also the main organ involved in energy production, by regulating carbohydrate and protein metabolism, hormonal activity, fat burning and blood sugar.

HEAVY METAL TOXICITY

Many toxins (such as heavy metals) are fat-soluble, which makes them easy to absorb but difficult to excrete. Metals become toxic when they are not metabolised by the body and accumulate in the soft tissues. In small quantities certain heavy metals are essential to healthy life, although they may lead to toxicity in certain circumstances. These include iron, copper, manganese and zinc. The toxic heavy metals we should be most concerned about are lead, mercury, cadmium and aluminium.



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Lead

Lead is the most widespread non-essential trace element. It is a powerful neurotoxin, has DNA-damaging effects and is teratogenic (affects the fetus). In our environment it is commonly found in petrol and cosmetics. Once absorbed it is stored in the bones and soft tissues and adversely affects the absorption and utilisation of iron, zinc and calcium.

Mercury

Atmospheric levels are low, but it bio-accumulates into highly toxic forms in the food chain – in particular seafood such as swordfish and tuna. In the case of amalgam fillings, vapour is released and increased upon stimulation by chewing, eating or tooth brushing. Toxicity may result in muscle weakness, mood swings and memory loss.

Cadmium

Cadmium appears to have no biological function. It concentrates in the kidneys, causing hypertension and bone damage. It is extremely high in cigarette smoke and is also found in food sources such as tuna, liver and kidney as well as tomatoes and potatoes. It is mainly stored in the liver and the kidneys.

Aluminium

Aluminium is found in household foil, beverage cans, kitchen utensils, food, medication and cosmetics. Excess aluminium is stored in the brain, bones and liver. Raised aluminium levels in children are associated with behavioural disorders.

DETOXIFICATION PROTOCOLS

Therapeutic detoxification is intended to support or augment the body's natural systems of detoxification. The major methods used include chelation therapy (to remove heavy metals), colonic irrigation, herbal medicine, dietary therapy, fasting, juicing, probiotics, hydro-therapy, sauna therapy, exercise, and vitamin and mineral supplementation.

Four main types of toxins are addressed through therapeutic detoxification:

- heavy metals
- chemical toxins (including drugs and alcohol)
- microscopic organisms and compounds
- byproducts from protein metabolism.

During some detoxification therapies, the toxins released from tissues build up in the bloodstream before they are excreted. As a result it is common to experience a worsening of symptoms until the toxins are completely eliminated. These side-effects may include headaches and other aches and pains, fatigue, skin eruptions (raised bumps, blisters, sores, or pimples), irritability, gas, tight muscles, yawning, temporary stopping of men-struation, and constipation or diarrhoea.

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In addition, some therapeutic detoxification therapies, such as colon therapy or fasting, may cause dehydration or depletion of essential nutrients.

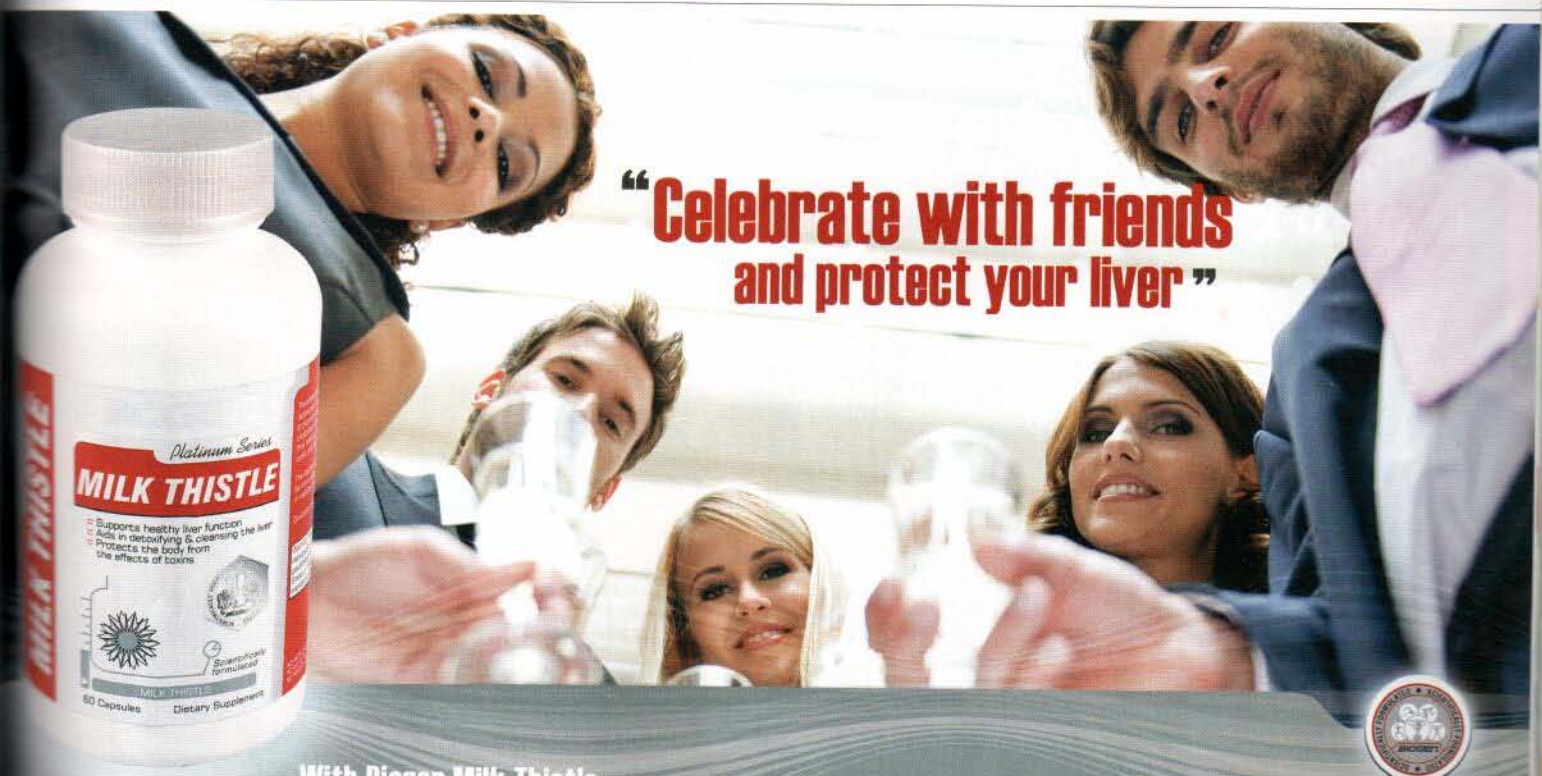
LIFESTYLE CHANGES TO SUPPORT LIVER FUNCTION

- Increase your intake of fibre, which binds to toxins and aids in their removal from the body.
- Wash non-organic fruit and vegetables well.
- Avoid commercially produced meat and dairy products that are full of antibiotic and hormone residue. Look for grass-fed and free-range or preferably organic products.
- Avoid fish that is likely to contain high levels of mercury. Avoid farmed fish, which is high in antibiotic residues.

- Avoid pre-packaged, ready meals and processed foods as they are high in preservatives and bacteria.
- Avoid salami, bologna and other delicatessen meats. They are high in nitrites and histamines.
- Read labels and avoid products that contain artificial additives and colours.
- Check the contents of cosmetics and deodorants, as many are high in lead and aluminium.
- If you smoke, it is essential to quit!

NUTRIENTS AND SUPPLEMENTS

The two main phases of detoxification by the liver are dependent on certain co-factors, including iron, magnesium, zinc, the B vitamins, vitamin C and the bioflavonoids. The best way to ensure that you are supplying



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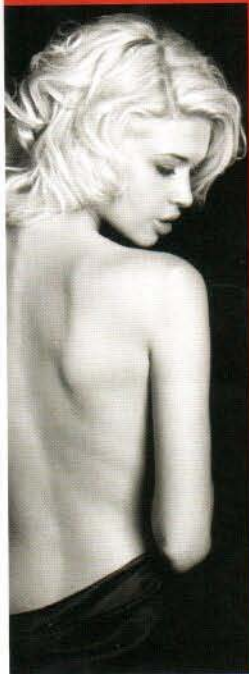




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IMPROVING HEALTH

your liver with enough co-factors is to eat a varied diet.

Supplements

Supplements that may help, include (but are not limited to):

Chlorophyll, a chemoprotein commonly known for its contribution to the green pigmentation in plants and related to proto-haem, the red pigment of blood. It can be obtained from green leafy vegetables (broccoli, Brussels sprouts, cabbage, lettuce and spinach), algae (chlorella and spirulina), wheatgrass, and numerous herbs (alfalfa, damiana, nettle and parsley). It is a key compound in improving the function of detoxification pathways.¹

Silymarin, which increases the detox-ification capacity of phase 2 enzymes. It is also a potent antioxidant. It is high in milk thistle.

Spirulina refers to a large number of cyanobacteria or blue-green algae. It is a rich source of nutrients including B-complex vitamins, beta-carotene, vitamin E and numerous minerals. Spirulina extract plus zinc may be useful for the treatment of heavy metal toxicity.

Turmeric. Curcumin, a polyphenol compound responsible for the bright yellow colour of turmeric, is believed to be the principal pharmacological agent. It has been used in traditional Ayurvedic medicine to tone the digestive system and the liver. It has been shown to reduce amyloid levels in Alzheimer's disease, possibly through chelating heavy metals.² This may make it particularly useful in supporting liver detoxification.

Probiotics. Probiotics are thought to aid in detoxification by preserving the intestinal lining's protective barrier and preventing bacteria that produce toxins from growing inside the colon. They have also been used successfully to bind cadmium and lead and are therefore an essential part of any heavy metal detoxification programme.



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Nutrients

Nutrients and co-factors that stimulate liver detoxification include:

- indole-3-carbinols, found in cruciferous vegetables such as horseradish, kale, broccoli, cauliflower, bok choy, watercress and rocket
- magnesium, found in pumpkin seeds, green leafy vegetables, beans and pulses
- zinc, found in calf's liver, sea vegetables, pumpkin seeds, lamb, basil and thyme
- vitamin C, high in papaya, bell peppers, broccoli, strawberries and cantaloupe
- flavonoids, high in berries, apples, lemons, and green and white teas
- sulforaphane, high in garlic, broccoli, onion, mustard and watercress
- selenium, high in fish, shellfish, sea vegetables, Brazil nuts and mushrooms
- B vitamins, high in meat, chicken, eggs and green leafy vegetables.

CONCLUSION

If you do decide that you could benefit from a detox programme, it's important to follow the right one for you. To make sure of this you may need to have certain tests, including blood, urine, stool and hair. If you are diabetic or pregnant it is vital that you speak to a doctor or nutritional expert before starting any detoxification protocol. Although the general principles of detoxification are universally the same (cut out alcohol, cut out fast food, eat more fresh food), to detoxify your body properly you need to follow a bespoke plan under the guidance of a qualified health professional. ●

References

1. Fahey JW, et al. Chlorophyll, chlorophyllin and related tetrapyrroles are significant inducers of mammalian phase 2 cytoprotective genes. *Carcinogenesis* 2005; 26(7): 1247-1255.
2. Baum L, Ng A. Curcumin interaction with copper and iron suggests one possible mechanism of action in Alzheimer's disease animal models. *J Alzheimers Dis* 2004; 6(4): 367-377.

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