

The Voice of Young Science network brings you ...

THE DETOX DOSSIER

An investigation by early career researchers into some of the many products, special diets, tonics and supplements which are widely promoted as being able to 'detox' you after the festive season.

In 2007 in *There goes the science bit...*¹ we challenged dodgy science claims that had taken hold in public. We discovered that companies often used phrases that sounded scientific but actually had little or no scientific meaning. We felt that the public were being duped. We wanted to do something about it and published our investigations with a call for other early career researchers to join us to Stand up for Science. And they did. They told us that there was more to be done and the word that came up over and over again was DETOX.

We all agreed that detox being used to sell everything from tea to hair straighteners was implausible and decided to dig deeper to find out what the product manufacturers meant by detox – had they some evidence about detox or how our bodies work not available to the rest of us? Our list of products to investigate was extensive *and* expensive, so we whittled it down to 15 products that were sold in a range of places and fairly represented what was out there in the shops.

We contacted the manufacturers to hunt down the evidence. Some products fell by the wayside as it became clear that the sellers were as confused as we were and unable to draw on anything but the marketing blurb, for example, Nicky Clarke cited confidentiality for

their Detox Salon Straighteners and referred us to “information on nano silver and its properties in the public domain”.

In fact, no one we contacted was able to provide any evidence for their claims, or give a comprehensive definition of what they meant by 'detox'. We concluded that 'detox' as used in product marketing is a myth. Many of the claims about how the body works were wrong and some were even dangerous. This dossier is a collection of extracts from our experiences.

Alice Tuff and Harriet Ball

About the VoYS network: The VoYS network are a group of early career scientists who want to stand up for science in public – from hunting down product claims to correcting misinformation in all kinds of media. To get involved or find out more you can contact Alice on 02074784380 or VoYS@senseaboutscience.org

This project was brought to you by...

Alice Blachford, Duncan Casey, Sarah Cohen, James Collins, Rachel Cooper, Anne Corbett, Laura Croft, Frances Downey, Olly Fenwick, Melissa Friswell, Chiara Gattinoni, Derek Gillespie, Haley Gomez, Robert Hagan, Evelyn Harvey, Rebecca Johnston, Matthew Jones, Anthony Kavanagh, Rachel King, Sunil Kumar, Jennifer Lardge, Kristin Lohwasser, Ian Mabbett, Sabina Michnowicz, Daniella Muallem, Lucy Natrass, Kate Oliver, Ben Saville, Simon Shears, Tom Sheldon, Harriet Teare, Carolyn Tregidgo, Sander Van Kasteren, Thomas Wells, Sarah Whitehead and Neil Young.

1

<http://www.senseaboutscience.org.uk/index.php/site/other/175>

² Sense About Science is a charity to promote good science and evidence for the public

Contents

Garnier Clean Detox Anti-Dullness Foaming Gel

“Detoxifies by cleansing the skin’s surface”

MG Detox Shampoo Trevor Sorbie

“Deep cleansing and clarifying shampoo”

Boots Detox Body Brush

“Ritualistic body brushing helps expel toxins through the skin”

Innocent Natural Detox Smoothie

“Helps neutralise nasty free radicals which can cause damage to your body’s cells”

Vitabiotics Detoxil 15 day support

“Helps the body cleanse itself of toxins and pollutants caused by the excesses of a busy life”

V-Water Detox

“Cleanse your system and whisk away the polluting nasties”

4321 Shape Up and Detox

“To drain off water and toxins” and “purify the body”

Boots Detox 5 Day Plan

Works “in harmony with your body to flush away toxins”

Farmacia Spa Therapy Detox range

To “rid your body of these damaging toxins”

Crystal Spring Detox patches

“I’m the easy way to detox, just put me on one foot at night and take me off in the morning”

Fushi Holistic and Health Solutions Total Detox Patch

“it acts as a toxin sink and absorbs impurities through your feet”

Garnier Clean Detox Anti-Dullness Foaming Gel

£4.49

Claims:

- “Detoxifies by cleansing the skin's surface.”
- “Eliminates impurities such as make-up and dirt from pollution, revealing your skin's natural radiance. Your skin feels fresher and looks clearer.”

Sold in: Boots, Superdrug, Sainsburys, Waitrose Deliver, Asda, Morrisons.



Laura Croft, chemist

Garnier's Clean Detox Anti-Dullness Foaming Gel uses the word 'detox' in its name, but the claims I found on the Garnier website made it sound just like any other cleanser. This claim - that a facial cleanser cleans - they can clearly back up, but although they list a series of ingredients that are often found in skin treatments for spot-prone skin, they offered no evidence for how these ingredients removed toxins. I wanted to find out more so I called the number on their website:

I was just wondering what toxins it removes and how it detoxifies your skin?

...Even if you were to use make up or whether you don't use make-up, on a day-to-day basis your skin's out in the open air, pollution and things like that can cause your skin, you know it forms a layer on your skin. What it does, is the ingredients that are in here, the main active ingredients would be something like zinc; it basically helps to eliminate the impurities that accumulate on your skin on a day-to-day basis.

What kind of impurities are you talking about?

Impurities from a day-to-day basis just by being out in the open

So like just dirt then basically?

Yes, but it's also, I mean this particular product, I mean this entire range is actually designed for people who perhaps have problematic skin. So in regards to impurities, that also, that's defining those sort of impurities as well. I mean if you don't have problematic skin, like oily or spot-prone skin it's not really something we would

recommend because it would be too harsh for your skin.

OK, so do you class like the oil and stuff as a toxin then?

Yes, absolutely, yes.

I hadn't realised that make-up and the oil on your skin would be classed as toxins by Garnier. They elaborated:

So toxins would mean something like sebum, so if you're prone to spotty, oily skin, that is a toxin for your skin in the sense that it's causing your skin to break-out. So if your skin breaks out, that means you've got an overload on toxins, meaning superficial toxins.

This cleanser sounded like it would be removing the same products from my skin that I would expect of any other cleanser so I asked directly:

If I used something else that was just a cleanser for oily skin would that work as well as your product then?

If it's from the Garnier Pure range then yes.

Garnier seems to define 'detox' as cleaning your skin and removing make-up, dirt and oil which are not 'toxins'. What they actually seem to be selling is product designed for people with oily, spot-prone skin not "normal" skin as it advertises. This is exactly what other cleansers in Garnier's range do but the detox gel costs over £1 more.

Companies use the word 'detox' as a trendy attention-grabber to sell products. This is misleading, suggesting there is something additional or special about the product. Many people would buy face wash without the 'detox' pretence anyway, but the more companies make such claims, the less shoppers really know what they are paying for, nor understand what detox is and whether they even need it. **Harriet Ball, VoYS**

MG Detox shampoo Trevor Sorbie

£4.99

Claims

- “Deep cleansing and clarifying shampoo”
- “Removes all traces of grease and grime and any build-up of styling products allowing hair to get cleaned up with the greatest of ease.”

Sold in: Boots, Trevor Sorbie.



Simon Shears, biologist

Various claims are made by shampoos from adding extra ‘sheen’ to reducing frizz, so when I first came across Trevor Sorbie’s Mg Detox Shampoo I wanted to know what was special about it. A glance through the claims revealed very little, it sounded remarkably similar to any other shampoo. To discover the science behind detox shampoo I called their general enquiries number and spoke to a sales representative:

I wasn’t sure of the difference between detox shampoo and normal shampoo.

Ok [...] the detox shampoo, it helps to strip out the [styling] product because obviously a lot of men use products on their hair these days.

Ok, but won’t normal shampoo do that?

It does but this is just sort of abrasive and really sort of pulls the product out and you generally follow that with a conditioner.

I tried to find out more about how it does this and I was put through to another representative who told me:

We have what is called surfactants in shampoos which are basically the cleaning agents in there. What we will have more of in a detox shampoo, is more of those cleaning agents that will actually foam up better in your hair and enable you to get right in down into the cuticles of each hair strand and strip out any dirt and grime product built up that you have got in there. Therefore you are cleaning your hair and leaving it nice, clean, fluffy hair afterwards...

Ok but I don’t know what I associate the word detox with but I don’t know, so it is just getting rid of the [styling] product?

Getting rid of dirt and grime which is what I suppose detox is. Detox is about when you detox your body you are flushing through, having water and everything to detox your body of all of the toxins in your body. So it is the same way of what your hair, what we are trying to do with hair, is getting rid of dirt and grime. And generally with guys as well they are using a lot of product build up and a lot of shampoos don’t get right into the hair cuticles to strip that out, you’re left with product in the hair the next day. So what this is doing is getting right down there to cleanse it better.

I then asked if it was doing anything to the actual hair or just the scalp:

No it’s not doing anything like that it’s just stripping; it’s just clean, extra, extra cleaning. So it’s not, we don’t have any anti dandruff ingredients in there or anything like that. It is just a cleaning product but more foaming than normal conditioner that just targets different things.

I spoke to a number of representatives at Trevor Sorbie and none were able to provide me with any scientific evidence for calling this shampoo a ‘detox’ shampoo..

Detox products that play on the image of detox to sell its product make us spend extra money for a product that offers no extra benefit – there can’t be many shampoos available that don’t use surfactants to clean your hair!

Boots Detox Body Brush

£4.40

Claims:

- “Brush away impurities from the body using the Boots Detox Brush on dry skin using long firm strokes in an upward direction.”
- “Stimulates the lymphatic system to help remove impurities and toxins from your skin.”
- “Removes dead skin cells, cleans pores and improves circulation.”
- “Ritualistic body brushing helps expel toxins through the skin.”



Tom Wells, chemist

Sold in: Boots.

I was intrigued by the Boots Detox Brush because most ‘detox’ products claim to remove toxins from the body and I couldn’t imagine how a brush could achieve this! The US website suggested it might work by stimulating the lymphatic system, which might sound plausible, but I wanted to find out more:

Right, okay, the main thing that the detox brush actually does is it’s exfoliating the skin, so it brushes away all those impurities from the body.

...Okay, when you say *impurities from the skin*, what do you mean by that?

As in the dead skin cells.

Okay, to me, I’m not an expert in this, but a dead skin cell doesn’t sound like an impurity, it sounds more like a part of the body that’s, you know, dead.

It is a part of the body that’s wanting to come away so obviously with the detox brush it helps you move that away and obviously you’ve got your fresh skin underneath which, you know, then appears smoother, feels smoother.

I moved on to ask about the claims on the Boots US website that it “stimulates the lymphatic system to help remove impurities”:

When the brush is going over the skin it’s actually massaging the skin at the same time. And obviously, as it is massaging the skin then it is activating, all the cells and everything you have just under the skin surface.

...Okay, so what kind of studies have you done to show that these skin cells are being aggravated, or activated if you like?

Alright, well this is obviously something that we have taken on but not patented the thing ourselves. So it’s not something that has been proven by us, it’s a product that we have developed alongside other companies that have already developed this product.

This sounded like a disclaimer to me so I tried to find out how the brush was any different rubbing with your hand or any other brush:

Well obviously, it is the firm strokes that are on the brush itself that are getting right into the skin. Obviously if you’re rubbing with your hand it’s a smooth surface you’re rubbing it with so it’s not going to have the same effect and it’s not going to be removing the dead skin cells from the surface.

But using a relatively abrasive flannel or something like that could remove dead skin cells.

Oh yes, certainly. Of course it could, yes.

But I rarely see things called detoxing products when they’re just removing dead skin cells.

Right, but it is still doing the same thing, it’s detoxing, it’s detoxing the skin.

Right, so by detoxing you mean removing dead skin cells?

That’s right.

So we agreed that there is nothing special about the Boots Detox Brush, it’s just a stiff bristled brush. Fine for removing dead skin but calling that “detoxifying” seems misleading. I was surprised that detox is such a broad term that it can be used to mean removing dead skin cells but clearly Boots believe so.

Vitabiotics Detoxil 15 day detox support

£7.95

Claims:

- “Helps the body cleanse itself of toxins and pollutants caused by the excesses of a busy life.”
- “Safeguarding the diet with essential vitamins and minerals when you are on a detox diet or exercise regime.”
- “Preserving those nutrients which are particularly depleted by alcohol intake and other toxins.”

Sold in: Boots, Superdrug, Lloyds Pharmacy.

James Collins, biologist

Detox products can seem like a quick fix for people who feel like they have overindulged or are feeling guilty about their diet, but claims about toxins and pollutants building up in the body contradict what we know about the body. I wanted to find out if this tonic was really a miracle cure all or not.

It just says toxins and pollutants; I wondered more specifically what you meant?

... Within the body ourselves we produce quite a lot of toxins and basically the Detoxil is formulated so it helps the body remove the toxins and preserves those nutrients that are actually depleted during the removal of the toxins.

I was then referred to the manager who produced a long list of uses for it.

It can be part of the weight management programme say, for example, you are trying to cut down on your fatty, trans fatty acids, trying to lose weight. And you want to detox your body for a period of time. It can be after Christmas time when you have had a lot of sweets [...] It can be part of your normal detox or when someone has been drinking a lot and wants to detox the body anyway. So it can be a part of any programme basically.

And he goes on...Detoxil seems to do a lot of different things!

What the product does, it gives you those nutrients [...] Which will help you transport fatty acids properly in your body, digest fatty, trans fatty acids in the body. As well

as, it will give you those nutrients which you don't get while detoxifying yourself...

So how is this different from a balanced diet and what toxins does it actually remove?

These toxins are basically free radicals [...] which cause oxidation, you know, oxidative stress in the body.

A long list of why free radicals are bad for me followed.

This stress leads to a lot of problems in the body. Firstly it affects your digestion, your general day to day routine things. It makes you feel more tired...It affects your immune system so you are more vulnerable to any kind of bacterial, fungal or viral infections [...] And these free radicals also make you age faster [...] Yes they have a damaging effect on your cells [...] you feel tired and a general loss of energy. The conversion of, basically, the body converts its energy from food.

Yes

Yes. There is a long chain you know, how your body takes its carbohydrates from foods and converts it into energy. [...] This process can be negatively affected by free radicals produced in your body which can be as a result of [...] pollution in the air and unhealthy lifestyle. So this is what you do to get rid of all that [...] You go through a detox programme.

Free radicals can cause damage but they do also play a vital role in your immune system. It sounded to me like Detoxil doesn't actually do anything but provide a source of nutrients.

OK, is Detoxil a support for the detox programme?

Yes

...And is there any evidence that these minerals and bioactive compounds that you have got are actually taken up during the detox programme?

... If you take a tablet and you are also having your normal meals even if you test the nutrient levels in your body you don't know where the nutrient is coming from – is it from the food or a supplement? But there are a lot of studies that have been conducted on individual ingredients which are in Detoxil.

Yes.

Yes. Which have shown clinical efficacy. And these ingredients and at those levels have shown beneficial results in people who have a weaker immune system or people with poor nutrition.

Which doesn't apply to most people who often detox after a post Christmas binge!

He then went on to talk a lot about what they had chosen to put in the tonic and what amounts they used, concluding with:

...So these levels are decided based on a lot of literature review, an extensive literature review basically.

Oh OK.

Yes, so we don't have a clinical trial on the finished product, because on this type of product it is very difficult to have a strong end point on a clinical trial.

Concluding with:

So basically you cannot have a very strong clinical trial on such product that has got all natural ingredients, which also forms a part of your regular diet

So for Viatabiotics, detox seems to mean removing free radicals by supplying a tonic of nutrients to help the body. This effect has not been proven and those nutrients are found in your natural diet anyway.

Detoxil claims to be a unique blend of 26 bio-active compounds that will support the body during a detox diet. Although they claim there are studies on the individual ingredients no studies have been done on the combination of compounds. How can they claim that the ingredients act "in synergy" if there is no evidence to support it? It could be the case that the ingredients have negative effects on each other's efficacy. Simply sticking together results from the literature does not give you a valid conclusion. **Sarah Whitehead, VoYS**

Innocent Natural Detox Smoothie

Price: c. £2 depending on retailer

Claims:

- "Help neutralise nasty free radicals which can cause damage to your body's cells"

Sold in:

- Waitrose, Sainsbury's, Tesco, Asda, Somerfield, Morrisons, Boots, Starbucks, EAT.



Jennifer Lardge, physicist

Innocent Smoothies had an Advertising Standards Agency ruling against them for claiming their "natural detox smoothie" had a detoxifying effect so I was surprised when I saw the same product in the supermarket several months on. I phoned their office to find out more but the person I spoke kept trying to direct me to their website. I then tried repeatedly to speak to the dietician but they didn't return my calls. Time for drastic action - I decided to stop by the Innocent Village Fete:

The detox smoothie is basically full of antioxidants

Ok

... it's kind of mopping up the free radicals...are you familiar with all that?

Kind of....

... Free radicals are the sort of things that when you smoke they give you the cancer and stuff [...] they're the things that go around and hit your DNA...

In my head [detox is] removing toxins...

...so the free radicals themselves are sort of a toxin that need removing in a sense, but your right, it won't wipe out every single toxin that you could possibly have in your body, no[...]I'm not sure that there's anything that really does that. So yeah, that's our kind of interpretation of it.

...The person who complained said about the liver detoxifying for you and you think you need to put good things in to balance out the bad. I was wondering what was the difference between any of your other smoothies?

Yes so it's the antioxidants in there. [...] All fruit does contain antioxidants actually so these particular ones are high in amounts of antioxidants. So it's improving but your right in that they're not detoxifying everything out of you.

He then told me that they had:

Removed the detox word as people were getting confused by it [...] we're not out to confuse people. We've got to be really careful about using those sort of words we're not trying to just con people into thinking that this is the thing that is going to sort out your lifestyle

Since my conversation the packaging has now been changed and it is a "superfruit smoothie" with pomegranates, blueberries and acai."

I am really pleased that Innocent have changed their packing but when I spoke to them they were still promoting the idea you can 'detox yourself' by antioxidants. However, it does show how we (as consumers) do have the power to force companies to change their ways!

Free-radicals are made in the body and can cause cell and DNA damage, but they also play an important role in our immune system protecting against bacteria and viruses. It is a superficially attractive idea that increasing our intake of antioxidants might help to prevent diseases (including cancer and heart disease) and the ageing process but there is little hard, peer reviewed evidence to suggest that anti oxidants alone can improve health.

Neil Young, VoYS

V-Water Detox

c. £1.29 depending on retailer

Claims

- “Cleanse your system and whisk away the polluting nasties.”

Sold in: Harvey Nichols, Waitrose, Budgens, Cineworld.



Frances Downey, physicist

A glass of water and a good night's sleep are well known to be the best 'detox' for your body but when I was handed a free sample of V-Water Detox I thought this was taking it a bit far! I gave the company a call and asked for the scientific evidence showing that herbal supplements can help the body "detox" itself. I was put through to the Sales team and I was told:

It's got the vitamins and herbs inside it that are beneficial for detoxing, [...] They're sort of old wives' remedies, but they're also scientifically proven to detox your system.

The Sales person went on to say:

Our drinks were designed by a celebrity nutritionist, and the way that it works is if you take some dandelion, it's a great way to flush your liver.

But what does it do to your liver? Liver flushes out stuff on its own[...]that's what your liver's for.

Exactly, that tells us that as you get older, it cleans out less and less. What [V-Water] does is, it boosts it.

It boosts your liver? I didn't really think that there was anything you could do to it to help it work better.

Yeah. I've got a friend who cannot drink any alcohol because her liver cannot cleanse it out of her system. She has now undergone treatment, and she takes two little tablets a day, and she can drink now because they have boosted her liver.

But that didn't happen after drinking V Water did it?

No, [...]after [a V-Water drink], you're not going to gee-up your entire system in one go ... if you are looking to go on a proper detox, this is something that's great to add to your regime.

Your liver is quite capable of processing most chemicals so how exactly can these herbs help it do this? I tried to dig further.

What I really want is an explanation of the science. Because you're saying "it helps" but what are you basing that on?

Well, I don't have a science qualification; I'm only going according to what I've been told.

This is fair enough so I tried to speak to the celebrity nutritionist. I was told that kind of information couldn't be given out to me and after further chasing I was given the email of the Supply Chain Manager. I emailed her and received a reply stating V- Water Detox was ***"formulated using herbal extracts that have been proven to aid liver function such as artichoke and dandelion."***

And how is this 'scientifically proven'? I was told that I would be able to find websites that discuss the benefits of dandelion and artichoke by searching on Google! Unsatisfied I got back to them and after a bit of cajoling I was told that their Nutritionist would call me. I am still waiting for their call...

I spoke to several people at V Water and disappointingly none of them could provide the answers to my questions. They defined detox as improving liver function but had no evidence for this. If companies are going to make scientific claims about their products they should be prepared to make available the evidence backing up their claims to anyone requesting it.

Confidential

4321 Shape Up and Detox

EDITORS NOTE This product has changed name and is now '4321 Slim' but still claims to 'drain off toxins' and to 'purify'.

£14.95 for the bottles £9.95 for the tablets

Claims:

- “3 plants to drain off water and toxins”.
- Fennel: “facilitating renal water elimination”
- Celery: “eliminating accumulated toxins”
- Barley :“to improve assimilative function in people suffering from digestive insufficiency.”
- “2 plants to purify the body”.
- Chicory: “increased elimination of toxins from the kidneys and liver”
- Maté: “beneficial action on the kidneys.”



Robert Hagan, biologist

Sold in: Selfridges, Holland and Barrett.

Drinks for detoxing seem to be widely available, which might mislead the public to think there is a scientific basis to some of these products when there's not. When I first came began looking into 4321, the company's webpage on the product seemed to have a lot of pseudoscientific terms and loosely defined words, which made me suspicious so I decided to go into more depth by ringing them. I first enquired about the difference between detox and weight loss. I was told that:

Detoxification is just to get all of the toxins out of your system, sort of thing, it clears you out...it's just getting rid of all the junk in your system basically.

I was then put through to the assistant pharmacist to tell me what toxins the detox was removing:

The detox removes all type of toxin from the body, it all depends on how you eat, how your lifestyle is. For example, if you drink alcohol, that builds toxins in the body. Now the toxins get stored in the body as fatty deposits. So what happens is the Shape Up and Detox range, what they do is they actually help breakdown and remove those fatty deposits.

... So all toxins are stored as these fats, is that right?

Almost all of the toxins, yes and the worst toxins will put a lot of pressure on your kidneys and on your liver and you know, the kidneys take a long time to break it down and process it. So it helps break it down, it helps get rid of it so, you will find that you will be urinating a lot[...]because it's getting broken down.

Alternatively I could be urinating more because the program has me drinking more than an extra litre of water a day!

She talked about the toxin build up in more detail and then told me:

Water's very important as well to break down the fatty deposits and helps the detox and most detox products contain diuretic herbs

She carried on to say:

Now, your first three days of cleansing or detoxing or having all this water eliminated, you might feel you have a few headaches. That's very normal. The reason being, the body's getting rid of all the toxins, all the bad things. So that's quite normal. So you'll up to a week you know, you can feel like that and straight after that, you'll feel ten times better.

I think this could be dangerous advice. The first symptoms of hyponatremia (a risk factor with detox diets or drinking too much water) include headaches, potentially indicating a swelling in the brain.

She then told me she would send me some clinical trials and continued to say:

It helps kidneys to process, to eliminate [the toxins] quick enough.

When I asked whether there were side effects she told me:

... You could spend the day running to the toilet

This sounded like a laxative to me and she agreed:

... Yes it could have a laxative effect.

Whilst we were on specifics I moved on to asking about the role of celery in the product, as discussed in their online material.

It says it cleanses the body of and eliminates accumulated toxins

It helps with the functions of the kidneys. I think it speeds, actually helps speed the system it ignites the endocrine to work better to produce a hormone that breaks it up.

She explained that it was a mineral in celery that was responsible for this, but didn't appear

to know what the words 'endocrine' and 'mineral' actually meant, explaining that 'endocrine' is:

... a gland behind your throat...

It's not. With regards to the mineral in celery responsible:

... it hasn't got a name...

Every mineral has a name. Finally, I checked whether there could be any side effects:

No, not at all. This is all herbs minerals, basically that's what it is. It's basically like going to the market and instead of having a tablet you're eating so many leaves of this vegetable and so many roots of that vegetable. That's all it is.

They didn't seem to understand their own claims, but offered to send their clinical trials on the product. The research they sent was a small unpublished study on weight loss which had no control group. The product sounds like a combination laxative and diuretics both of which can be harmful and are unlikely to have a long term effect. I think it would be far better off (in terms of health and finances) to stick to the vegetables.

Boots Detox 5 Day Plan

£13.50

Claims:

- “Helps refresh and detoxify your body”
- “Leaves you ‘feeling revitalised and re-energised”
- “Works ‘in harmony with your body to flush away toxins”



Sold in: Boots.

Evelyn Harvey, biologist

Detox diets are everywhere in the post Christmas season. I couldn't see how they could be of any more benefit than a normal diet and a good nights sleep so I decided to investigate Boots 'detox 5 day plan'. This consists of five 'phials' of apple or strawberry flavoured goo containing two vitamins and one mineral mixed with glycerol. Over five days, each dose is mixed with a litre of water and drunk throughout the day.

Ok, so how exactly does it work, is it supposed to be a medicine?

No, it's not. It [...] helps your detoxifying organ clear out toxins.

Detoxifying organ? Haven't heard of it...do you mean the liver?

Well, it's a more scientific term for it.

Since the liver is, medically speaking, 'the liver', I was confused. Several different organs are also given the title of 'detoxifying organ' by different detox sellers – the skin, the large and small intestines, the kidneys, liver and even the brain (psychic detox, anyone?) appear in a web search.

So, does it say you should eat while you do the detox? Because some people try to lose weight doing this and don't eat enough, like a friend of mine.

Yes, you should eat [...] it says to eat fruit and vegetables, whole meal bread, fish, rice [...] don't drink alcohol.

Sounds good. But won't that be the main detox, then?

What do you mean?

Well, have you tested the effects of that diet, with or without the detox product? Does the 'goo' stuff [the drink which forms part of the plan] add anything extra?

Well, it's meant to kick start it...

But has is been tested like that?

No.

Ok, I'm thinking I'll just try a healthy diet for a week, a bit more exercise, and not bother with buying the detox.

Yes, that sounds like a better idea, to be honest I'd never do this myself.

At least we agreed on that! So will any of this help your 'detoxification systems'? In a word, no. It won't do you any harm either, unless you count the laxative effects of overdosing. However, following the dietary advice given on the back could be beneficial.

During detox, Boots advise, you're meant to avoid processed and convenience foods, dairy products, alcohol, caffeine, and sweets, and eat plenty of fruit, vegetables, fish, wholemeal bread and brown rice. If you habitually eat and drink too much of the wrong things, your body will thank you for five days of wholesome nutrition. You may even lose a little weight, but it will have nothing to do with the contents of the detox phials.

Farmacia Spa Therapy Detox range

£18.95 (detox foot pads)

£36.95 (detox bath accessories)

Claims:

- To “rid your body of these damaging toxins”
- “harness powerful natural ingredients, including tree sap”
- “the principles of foot reflexology”

Sold in: Harrods, Selfridges.



Tom Sheldon, computer scientist

This product is one of a whole swathe of detox products on the market. I can't see how they can possibly rid our bodies of 'damaging toxins'. They seem to me to be nothing more than cosmetics. Our bodies process most chemicals we encounter in daily life, which was why I was surprised to see the manufacturer's website claim we "absorb toxins every day through food, drink and pollution". They sell a range of products including detox pads and detox bath accessories to counteract these so I phoned Farmacia at Harrods to see what they could say to back this up:

... Detoxifying, in that sense, they actually take the impurities out of your body basically. Every day we produce bad nutrients, our liver produces a lot of waste products, and the detoxifying process gets rid of that.

We then moved onto discuss the detox footpads that are part of the range and whether they could actually help following a Christmas binge:

What if you put one on and you drank a bottle of wine and smoked twenty cigarettes, would you feel absolutely fine?

Absolutely, sir, no, this is the thing. Detoxing, all the detoxing process, they are actually courses and during that course we ask you to refrain from drinking and alcohol and things that are actually going to interfere with your detox programme so that, for that period of time...

Right, okay, but again – wouldn't it be just exactly the same if you just stopped drinking and smoking and you ate well and drank plenty of water and got a good night's sleep?

No, there's no substitute for that at all, there really isn't.

Well then, if people are reporting feeling better, maybe that's just because they've...

It could be a placebo effect, it could be the fact that they're just using something...

I understand that there's so many people out there that don't believe in this sort of stuff, and I must admit myself I'm probably a bit of a skeptic as well but just hearing the customers' responses, it changes your view, it really does.

It was strange to hear from the rep himself that the effects only emerge when people start eating and sleeping better; and that subjective reports of well-being might be a placebo!

So do you know if there's scientific, medical evidence of the efficacy of this? I mean it would be really easy to do a trial, wouldn't it?

Absolutely, sir. And there have been numerous studies, absolutely right. There have been very many scientifically controlled studies and unfortunately the findings are inconclusive. Unfortunately if they were conclusive then this stuff would sell off the shelves, like no-one's business.

But it probably does anyway, doesn't it? Because people see...

It does! Because people believe.

People see the word detox, and then they think it must work?

Absolutely. And you have to be careful when you look at these papers, because some of them aren't by reputable journals. You'll get loads of studies saying yes it's fantastic it works, but anyone could have written them so you have to be very careful with that... But as I said before, sir, it's proven to a certain extent and it's also disproven to a certain extent as well.

Right, okay, so inconclusive.

Very inconclusive. You can't say 100% that this stuff works – no-one can tell you, and if they tell you that then they're absolutely lying out of their teeth...

It still wasn't clear whether detox was science or superstition – in my opinion, not good enough for a word that is touted so widely to an accepting public.

I then asked about spa therapy range which claims to “harness the benefits of the marine plant and super nutrient chrystimarin”:

And as I said before, all of this stuff is no substitute for a balanced healthy diet, because you can get all these amino acids from food. But it can be very difficult to extract some amino acids, and that's why they have them in this form...

I can understand that if you wanted to put amino acids, vitamins and minerals into your system then a balanced diet will give you those things because you're ingesting it. But looking down the list of products they're creams, toners, lotions, gels and shampoos, so everything is applied to the skin..

Yes.

So how do we know that these important molecules are passing through what is the thickest, most impermeable membrane in the whole body?

That's is a very good question, and there's a lot of studies going into it at the moment as we speak, sir[...]Again, I can't give you a solid answer on that, and the answer is that sometimes these things need a little bit of faith, and perhaps they work, but perhaps not.

So, it's a question of faith then?

Yeah, it really really is. You're absolutely right. But there's no decent evidence that it works.

Having established that detox is a faith position, we moved on to talk about what's the difference about a detox shampoo compared to a conventional shampoo:

Okay, it's usually just the different ingredients that they use. In the sense that, the detox shampoos won't have any harmful chemicals in them, and regular shampoos do.

So in this context, detox means not putting bad things on your hair, it doesn't mean taking bad things out of your hair?

Yes, not necessarily. Just putting these products onto your hair is a kind of detox in the sense that you're not bombarding it with any chemicals.

In other words detox is the same as doing nothing – only more expensive. This is marketing spin of the worst kind, and surely misleading to anyone paying through the nose for products like these.

Although the rep was doing his best to be honest throughout, detox seems to be a concept based on wishful thinking; and there is not a scrap of evidence to support the idea that the body's natural detoxifying process can be boosted by pads, creams or lotions.

Crystal Spring Detox patches

Price 24.99 for pack of 14

Claims:

- “A natural source of negative ions and Far Infrared – good for health and wellbeing.”
- “Made using a combination of natural herbs and semi-precious tourmaline crystal.”
- “Works while you sleep.”
- “I’m the easy way to detox, just put me on one foot at night and take me off in the morning.”



Sold in: Holland and Barrett.

Daniella Muallem, biophysicist

As a scientist, I must justify my claims with evidence, and I must keep an open mind as sometimes the evidence is surprising. Detox patches are designed to be stuck on the sole of your foot while you sleep to remove toxins. Whilst a product that improves health with almost no effort is very appealing, it also seems unlikely so I contacted Crystal Spring who supply detox patches to Holland and Barrett.

I spoke to the customer liaison manager who told me:

Basically how they work ... It contains something called Tourmaline crystal. Now Tourmaline crystal acts like in the infrared. You know the way the sun reacts with the skin and makes you perspire.

Sorry, so how does the sun make you perspire, doesn't it just make you hot?

Yes, but the effects it has are called far infrared. That's kind of like the technical name for it. And the Tourmaline crystal does the same, sort of mimics that basically.

Ok

And then through the perspiration, when you perspire, in the teabag there is also wood and bamboo vinegars and they are what draws the toxins out through perspiration.

....are you saying that these make more toxins come out? Or...

It makes you perspire more. It will make the skin under the pad perspire more than normally.

So it basically makes you have sweaty feet?

Well just under the pad yeah.

She wasn't able to give me any technical information but I arranged for her to email some further information to me. I then asked her about the health benefits. She told me that they:

...range from person to person and ...we have had one person who has severe swelling in his legs. I think it was a medical thing that he had...but he used them and it got rid of the swelling so he could start walking again.

All medicines have undergone rigorous testing and clinical trials.

So how do Crystal Spring know the patches work?

Well that's hard to say because we don't get references back from anybody...I think since November I have had two people who have phoned up and said we actually haven't felt anything from them, which is very small proportion because we do get testimonials through from people that it does work for.

I guess you have never done trials or tests to see that they do have health benefits.

Well no, to do a test you are looking at quite a lot of money. You know to invest quite a lot of money.

She again referred me to the information she was emailing me. This information was straight from the manufacturer, most of the tests had only been done on one person and none were published.

It seems to me they are making money from a product that they are selling but have no evidence. I needed to find out more...

I emailed the managing director of crystal spring to ask him to clarify if the footpads actually increase the amount of toxins drawn out. He referred me to the manufacturer's website with the disclaimer:

...the views or comments expressed by our manufacturers are not necessarily those of Crystal Spring

I also asked him if it was correct that if the crystal did emit far infrared that heat up the foot and if there was any evidence that heating one foot leads to health benefits:

This is correct, as stated in the literature...

Finally, I asked about the dark sticky substance that appears on the patches once

they are used. This is cited as proof that the patches are working to remove toxins. But couldn't this just be the wood vinegar (a red-brown powder contained in the footpad) getting wet from your foot sweating? His answer:

Yes the footpads turning brown is due to the ingredients getting wet....

I did contact the manufacturers directly to try to clarify some of the scientific points but all I received was several emails full of jargon and flawed evidence. I was left feeling that Crystal Spring simply did not care whether the claims they made were true.

I checked with a mineralogist about the tourmaline and he told me:

Its heat emission will simply be the same heat of the environment since minerals (except strongly radioactive ones) do not generate their own heat. Tourmaline is not particularly radioactive. Therefore the amount of heat it emits is the same as the heat it absorbs [i.e. from your feet].

Dr Adrian Finch

Another VoYS person investigated a different set of detox patches. Interestingly they disclaimed any detox effects but focused on its pain relief claims. Perhaps they took note of our investigation into Champneys Detox patches last year in *There Goes the Science Bit...*

Fushi Holistic and Health Solutions Total Detox Patch

£19.95

Claims

- “The easy way to detox while you sleep”
- “It does not put anything into your body.”
- “...it acts as a toxin sink and absorbs impurities through your feet.”
- “...helps your body get rid of the impurities that may cause stiffness, aches and pains and affect sleep.”



Harriet Teare, chemist

Sold in: Fushi stores, Waitrose, John Lewis.

Fushi detox patches claim that by applying a detox patch to the soles of your feet you are able to detox while you sleep.

References to your circulation, toxin sink and flexibility, mixed in with allusion to reflexology and acupuncture, make for a confusing and potentially misleading combination of could-be scientific treatments. I thought this all sounded a little too easy, so decided to call their customer services to check it out.

Unfortunately the naturopath wasn't available so I spoke to the customer services advisor. I asked how the foot pads were drawing out toxins but was given little information, just some descriptions of the ingredients. When probing the advisor on exactly what was meant by 'detox' he agreed that it was a confusing term.

...So when you say 'detox' what do you actually mean by that?

It just helps, it's not like if you're on a detox programme, it's not going to detox you inside out like other things are. [...] What it does is it helps, it draws out the impurities. A lot of people really use it, we call it a detox patch because it draws out the impurities, but what it's really used quite a lot, we've found, is with aches and pains?

...So the soothing effect of the infra-red mineral might perhaps be more of a thing then?

Exactly, it's one of these things that people, a lot of people could be suspicious of it, myself as well. [...] I've used it personally for drawing out toxins, I've not used it for aches and pains, personally, but our naturopath here swears by it, especially for aches and pains.

Despite advertising their products as the easy way to detox, it quickly became clear to me that the Fushi representatives didn't believe the detoxing capabilities of the product either, but readily recommended the patches to ease aches and pains despite having no evidence to support this.