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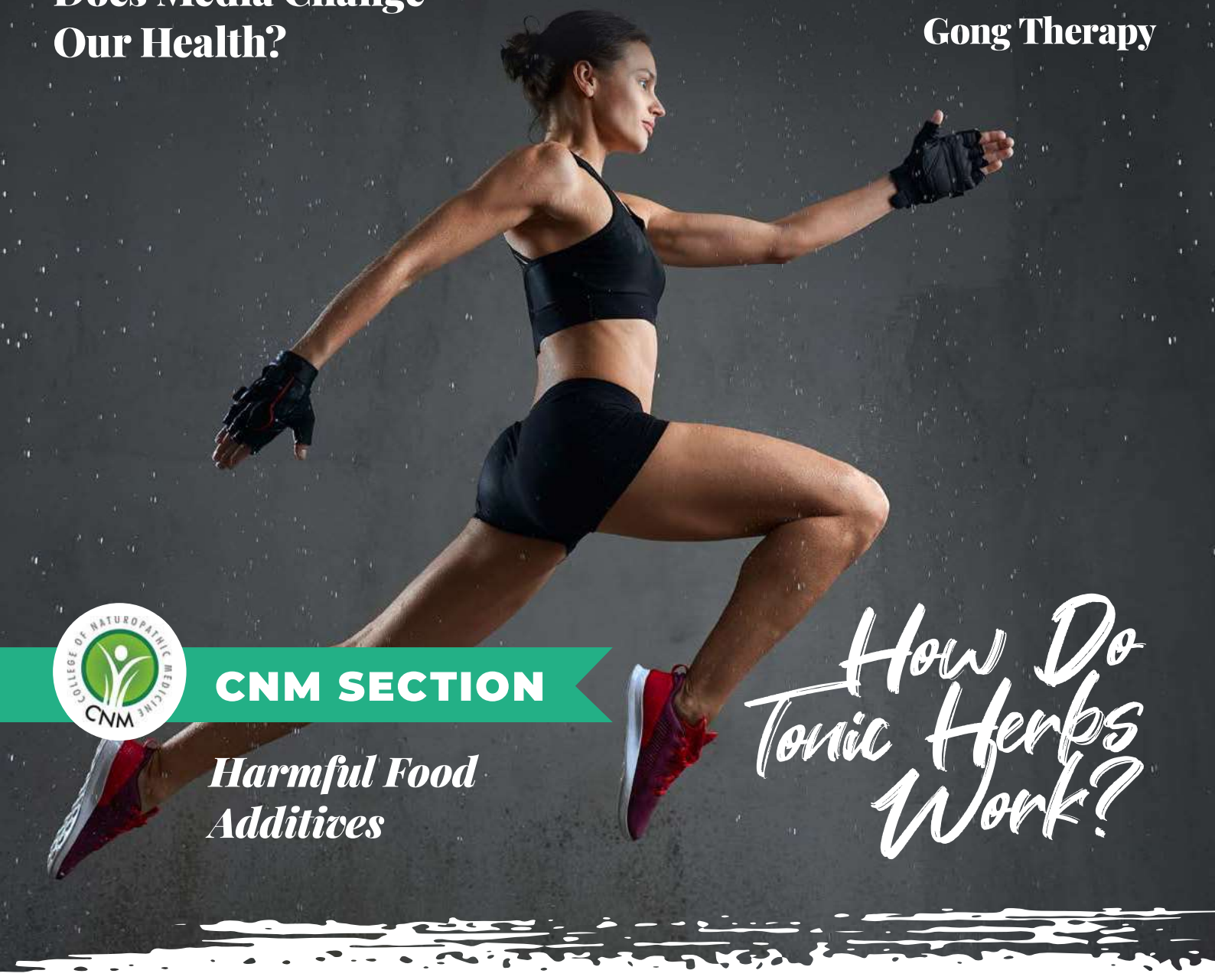

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Harmful Food Additives

Every Naturopathic Practitioner Should Know About

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Pick up any pre-packaged food from a supermarket shelf and read the ingredients list; even better, do it out loud. Soon you'll stumble over at least one unpronounceable word. The food industry not only add hundreds of 'unpronounceables' to the food, they also go to great lengths to hide undesirable ingredients (like sugar) under different names, further confusing the issue. As for things that are 'not on the label' because they do not have to be declared, more of this later.

We use the words "Food additives" for the chemicals deliberately added to foods and drinks for longer shelf life, better taste, visual appeal, etc. Rarely do we consider anything else. But as a naturopath with extensive clinical experience, I can tell you things are not that simple. It's not just highly processed foods that contain additives with negative health effects. As Naturopaths we are already aware of how chemical additives cause or contribute to many health issues, from allergies to behavioural problems. This article sheds light into substances which we may not even think affect our clients and why clients might not progress as well as we expect them to progress with treatment. Our profession is like a good detective's: suspect everything, examine all clues and ensure your differential diagnosis is spot-on when supporting clients in their healing journey.

Let's start with **foods**

What are "everyday foods"? For the sake of simplicity, I offer some definitions to help us grapple with this vast subject. So, for me, "everyday foods" may include:

- **Produce we eat (meat, poultry, fish, game, dairy, vegetables, fruit, grains, legumes, and their derivatives: processed breads, spreads, cakes, biscuits, sauces, sweets, tinned goods, pre-packaged meals and salads, deli meats, cheeses, condiments) – chewing gum is on this list (more of this later)**
- **Drinks (dairy, juices, teas and coffees, hot chocolate, alcohol, fizzy drinks, etc.)**
- **Medications (both prescription and over-the-counter)**
- **Nutritional Supplements**
- **Cosmetics, clothes and sanitary products; although not foods, what we put on our skin ends up inside our body and can cause systemic issues. For example, sanitary pads containing cornstarch may cause severe allergic reactions to people with corn allergy – and most people would not connect the two. A rule of thumb: If you can't eat it, don't put it on your skin.**

From anti-caking agents and flavour enhancers to thickeners and antioxidants, most packaged/processed food and drinks contain additives – as do prescribed/over the counter medications and many nutritional supplements: sulphites, nitrates, benzoates, citrates, phosphates, sorbates, glutamates. Many are 'E' numbers and most have undesirable effects severe enough to make news headlines: "Banned E numbers found in over-the-counter medicines for CHILDREN: Anbesol teething gel and Calpol among 19 products containing colourings linked with hyperactivity, according to Action on Additives." (The Mirror Newspaper, UK, 22/10/2013).[1]

Many countries have banned some E numbers. An online search reveals lists of these banned substances along with their harmful effects and where they are found, so I won't spend time on them, although I shudder at some of their 'cute' alternative names like 'sunset yellow' or 'allura red' – as if giving them an insipid moniker renders them harmless. The Environmental Working Group: https://www.ewg.org/, and various smartphone apps like E Checker or E-Inspect, can help you get to grips with Food Additives. However, I have listed below the main groups of additives, their known health impact and where they are found.

'Declared' food additives fall into a few broad categories:

- **Thickeners** and gelling agents add texture to watery concoctions (soups, puddings, yoghurt). Carrageenan (407), used as a thickener in many products (also injected in meats and found in organic foods) can cause gastrointestinal inflammation and bowel disease, triggering an immune response such as when our body becomes invaded by pathogens like Salmonella.[2]
- **Flavour enhancers** improve bland unappetising foods. Monosodium L-glutamate (621) (MSG), added to packaged and takeaway food and some vaccines[3,4], is a potent excitotoxin (damages the nerves)[5,6,7], can cause numbness/tingling, heart conditions and depression. It may hide in foods as 'hydrolysed vegetable protein' (HVP).
- **Colourings** make food look visually pleasing; margarine, for example is an unappetising gray-white; the added yellow dyes, annatto and/or cochineal make it look like butter. Annatto (160b) and Cochineal (120) are two of the worst food colourants, implicated in irritability, headaches, hives, sleep disturbances, respiratory conditions and allergic reactions.
- **Preservatives & Antioxidants** increase shelf life and reduce rancidity (think Egyptian mummies and you get the idea). Sulphur dioxide (220), commonly added to foods and drinks destroys vitamin B1 and may cause asthma, anaphylaxis, nausea and gut issues. Butylated hydroxyanisole (320) (an antioxidant)

is very toxic and has been linked to immune, hormonal, respiratory and skin-related conditions.

- **Sweeteners** are added to improve taste, make things taste sweeter, reduce calorific value and enable 'low sugar' claims. Here we find saccharin, various polyols (xylitol, mannitol, etc. - more on these later), aspartame, ace-K, steviol, etc. Some of these are excitotoxins implicated in nerve and brain damage and gastrointestinal issues, to name just a few of their adverse effects. Despite their 'low-calorie' claims, most artificial sweeteners do have an (unsuspected by regular consumers and most practitioners) effect on blood sugar fluctuations and contribute to obesity and liver damage.[8,9,10,11,12]
- **Emulsifiers and stabilisers** stop ingredients from separating and improve food texture. They are chemicals similar to detergents and have been shown to promote gastrointestinal inflammation and colon cancer in mouse models.[13]

All these chemicals are usually found and eaten in combination; no independent research exists to determine what COMBINED use of such chemicals might do to our gut. Is it surprising that gastrointestinal issues are becoming a massive – and "baffling" – health concern?

Besides these chemicals, there are substances added to foods that most people don't suspect or consider harmful, such as artificial 'nutrients' added via food fortification:

Food Fortification:
"Food fortification or enrichment is the process of adding micronutrients (essential trace elements and vitamins) to food. It can be carried out by food manufacturers, or by governments as a public health policy which aims to reduce the number of people with dietary deficiencies within a population." (From Wikipedia).[14]

So, food fortification offers nutritional benefits to potentially undernourished people. Or does it?

Take wheat flour; processing removes a large number of invaluable micronutrients from the final flour which is used to make bread and other baked goods.[15] Fortification adds back some of these – but are artificial lab chemicals really nutrients? We are faced with two potentially serious problems: (a) the body struggles to recognise and use these artificial substances, wasting valuable resources it would otherwise employ for repair and healing; (b) these lab-created chemicals can block cell receptors from absorbing the true nutrients, causing further malnutrition – folic acid is a case in point:

"Synthetic folic acid supplementation in pregnancy has been implicated in a number of serious problems… and showcases some of the pitfalls of synthetic vitamin food fortification."[16,17,18]

Research implicates folic acid and glyphosate present in flour as the real issues rather than gluten per se in "gluten-sensitive" individuals.[19,20,21] Think about it: We process food within an inch of its nutritional life, denude it of vital, real nutrients that our bodies have evolved since primordial times to recognise, then add back questionable chemicals with unknown or harmful effects in a poor attempt to 'fortify' it. How can this be viable in terms of nutritional health and environmental sustainability?

This is where a Naturopath can make a difference, explaining to our clientele that, (a) synthetic additives are a burden to the body, are not well absorbed and lead to malnutrition; (b) it doesn't make sense to deplete food and then add to it; (c) food fortification encourages manufactured, synthetic and GMO food.

And a good question to ask a client would be, "Why not just use food in its natural state?"

Food Fortification and Food Additives are examined more thoroughly in the College of Naturopathic Medicine's Naturopathic Nutrition Diploma Course.[22]

Interestingly, the same 'science' which advocates and endorses fortification with artificial 'nutrients' demonises nutritional supplements (a great number of which are made from the same chemicals) as useless.[23]

There is evidence that food fortification may have health impacts[24], however, there have been no independent long-term studies on the safety of artificial food fortification.

Food Fortification and Food Additives are examined more thoroughly in the College of Naturopathic Medicine's College of Naturopathic Medicine lecture on Food Additives that is part of the CNM Naturopathic Nutrition Diploma Course.

And in a remarkably interesting, if ironic twist, the Irish Supreme Court has recently ruled that the 'bread' used by fast food chain Subway is not actually bread because it contains too much sugar.[25]

Which brings me to another type of food additives which I consider insidious because most of us would not consider them additives:

Foodsubstances as additives

Some 'food' substances are used as additives; their addition can have harmful effects on our health – especially in individuals who are on restricted diets due to health conditions such as diabetes. The most common of these are sugar and salt.

Sugar is used as preservative and flavour enhancer in numerous foods. You'd think sugar is sugar and that's it. Well, no. We have come a very long way from the sugar our grandmothers used to make jam. Sugar sleuthing in packaged foods is an art; here's a very small selection of sugar 'personas' in processed foods: sucrose, fructose, glucose, high fructose corn syrup, dextrose, maltodextrin, agave syrup – over 50 different names are used by manufacturers to hide the true levels of sugar in processed foods.[26] If you are watching your sugar intake and eat processed, prepackaged foods, you may be in for a few surprises (and undesirable blood sugar fluctuations). Why? Because different types of sugar are metabolised differently by the body; some disturb our insulin

management and cause blood sugar to go haywire; some burden the liver and are converted to fat; all affect the balance of beneficial microorganisms in the gut to some degree. A rise in type II diabetes, non-alcoholic fatty liver disease (NAFLD), fungal infections, IBS, obesity and cancer are some of the implications of high refined sugar consumption in the modern diet.[27,28]

Salt (and other sodium-containing substances) is another food substance which is added to foods as a preservative and flavour enhancer. Salt acts as a preservative by altering the availability of water in foods. This means that microorganisms cannot use water as a nutrient (see also further down this article about water in foods). Normal salt is made up of sodium and chloride ions, but like sugar, there are numerous names for sodium-containing chemicals, including:

Disodium ethylenediaminetetraacetic acid, sodium acetate, sodium ascorbate, sodium benzoate, sodium diacetate, sodium lactate, sodium nitrate, sodium nitrite, sodium phosphates, sodium propionate, sodium sulphite, etc.

These chemicals appear in many foods including mayonnaise and dressings, tinned and baked goods, cured meats, cheeses, jams and preserves. Beware the ingredients listed on the packet – especially sodium. Even 'reduced sodium' foods may still contain more sodium than you'd expect. Sodium is listed as 'milligrams per serving', and that may not mean the whole package. If you are on a sodium-restricted diet and you have a whole tin of chicken soup (let's face it, most of us would eat more than what is considered one 'serving' – another misleading and largely irrelevant notion), you may be eating two or three servings, and so you may be getting a great deal more sodium than you should. According to the WHO, high sodium consumption has been implicated in a variety of health issues including heart disease, high blood pressure and stroke.[29]

Also, some of the sodium-containing chemical compounds mentioned above act in various damaging ways in our body, including destroying vitamin C and potassium balance.

Clarification: when I talk about salt, I mean processed, refined, table 'salt', not natural unprocessed salt.

Case:

Female 52, presented with hot flushes, racing heart, recurrent unexplained 'itchy rashes' and 'restless legs'. GP had warned she was high-risk type II diabetes. Mainly organic diet; sedentary. Weakness for cake, biscuits, tea and craving cold lager. Functional testing revealed low magnesium, chromium, and some B vitamins, high aluminium and mercury as well as GI dysbiosis. She had had metal amalgams removed 7 months previously and her symptoms had escalated a few weeks after that, but she had not connected the two. Was recommended a gentle detoxification diet, transdermal magnesium, a food-state chromium supplement, advanced probiotics and bentonite clay packs. Made good progress over 4 months but kept relapsing. On closer questioning, she said she had been told by a friend to "drink more water" to "help her flush out the toxins" so she had gone from 1.5lt to 4lt a day. She also still drank at least 4 cups of tea daily with 2 sugars each – she could not stop this. She was advised to: (a) sip 1.5-2lt water throughout the day and (b) reduce the sugar in her tea slowly over a period of weeks. She managed to go down to 2 cups with 0.5 tsp sugar each daily in the space of 2 months. Then, suddenly announced she was stopping tea altogether: as her health improved, she had noticed that drinking sugary tea made her worse. Her cravings for lager and other sweet pastries had also diminished. Outcome: Hot flushes reduced greatly in frequency and severity; no racing heart; no rashes; no restless legs. This process took just under a year.

Not on the label:

unsuspected substances in food

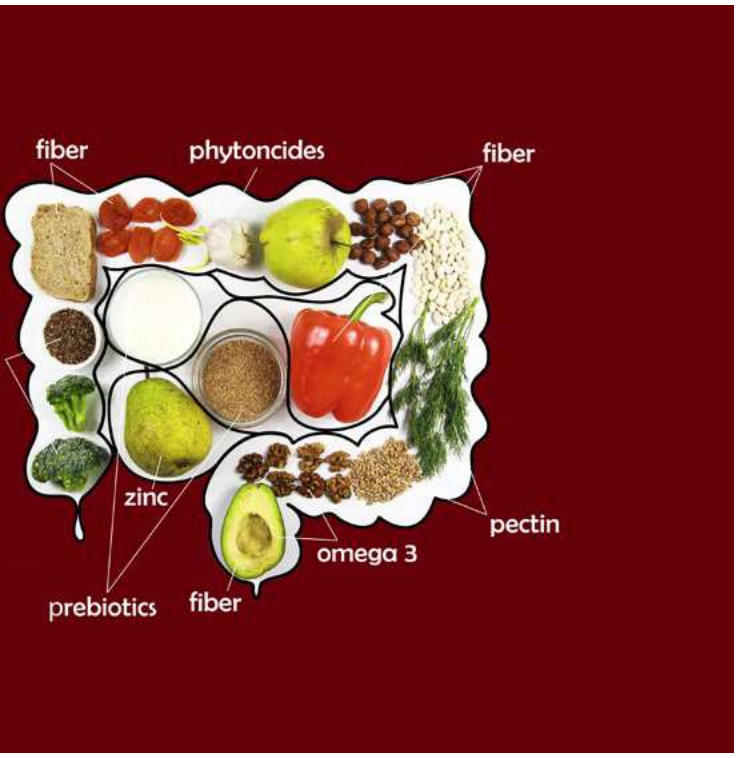
I recently read an article about whiteners in chewing gum… Who'd have thought that chewing some wonderfully mint-flavoured, xylitol-impregnated gum to freshen the breath would be a problem? Yet, according to recent research:

"A food additive (titanium dioxide nanoparticles - E171) that whitens desserts, drinks and gum could be triggering heart disease, obesity and inflammatory bowel disease (IBD). Already banned in France, E171 radically changes our gut bacteria, causes colon inflammation and affects liver function."[30]

So – heart-stopping stuff, indeed.

Plus chewing gum means swallowing minute plastic particles, most deriving from petrochemicals – with unknown consequences: "Manufacturers don't have to disclose which of the above products[31] they use and in which quantities (it will usually just be listed as 'gum base') so there's no way to tell which you're ingesting."[32]

And since I mentioned xylitol: I have already talked about artificial sweeteners and what they could be doing to the gastrointestinal tract, but here is an added note about xylitol and other 'polyols' (e.g. sorbitol, mannitol, erythritol). They can be naturally found in small quantities in fruit, vegetables and grains, but as food additives they are artificially produced bulk sweeteners, used to sweeten a wide range of foods, drinks, gums, toothpastes and mouthwashes; some are used as substitutes for sugar in hot and cold home-made drinks, cooking and baking. They



are popular, especially with diabetics and weight-loss regimes because most have low or no calorific value and are not regarded as influencing blood sugar levels (an important consideration with diabetics whose insulin levels need to be tightly controlled). However: some still have calories; they can and do influence blood sugar levels; they may cause other undesirable, unsuspected issues. Some have antibacterial activity and may alter our gut microbiome; hence they are a FODMAP food group. Some have more profound effects: xylitol, for example, appears to disturb protein synthesis in vitro[33], is lethal to dogs[34] and can cause diarrhoea and other gastrointestinal issues in humans.[35,36,37]

Water

One surprising food additive: unless contaminated with heavy metals, chemicals or pathogens, no one would consider water as a harmful additive to foods. But…

If food producers injected water into meat and poultry to keep it looking fresh, plump and moist and increase its weight,[38] I would consider this an additive, wouldn't you? In fact, not only this is a standard practice in the food industry, some producers go the extra mile. According to a Wikipedia entry, in a process known as 'plumping', raw chicken (and other meat) is injected with saltwater, chicken stock, seaweed extract (i.e. Carrageenan) or some combination thereof: "Plumped chicken commonly contains 15% of its total weight in saltwater, but in some cases can contain as much as 30%."[39] Since the price of chicken is based on weight, imagine the extra costs to the consumers and the profits to the industry. And, of course, people on a restricted sodium diet wouldn't have a clue about the hidden salt (between 200 mg and 500 mg of sodium per serving) in their plump chicken –something that could endanger their health.[40,41]

The opinion of attorney and food poisoning expert Bill Marler on possible issues with pre-washed produce is eye-opening. He advocates avoiding pre-washed and pre-cut fruit and vegetables on the grounds that the more a food is handled and processed, the more likely it is to become tainted. He sticks to unwashed, uncut produce, which he buys in small quantities and eats within three to four days to reduce the risk for listeria.[42]

So, in and of itself, water is not necessarily an additive. However, the line is blurred when water is deliberately added to produce (along with other potentially harmful substances not declared on the label) to alter its weight and appearance, or when pre-washing vegetables and salads encourage the propagation of pathogenic organisms whose toxins are definitely undesirable and harmful 'additives' in our food.[43]

And talking about water… a rather large elephant in the room is the quality of drinking water that comes out of our taps. It is a huge topic and I won't expand on it here. Suffice to say that tap water is shockingly full of undesirable additives including the 'legal' poisons we know about (fluoride and chlorine). Local water companies can provide information on fluoridation and also water testing facilities if needed and I urge people to find out this information from their local water supplier.

Additives in medications

Oral medications may contain a variety of additives, including dyes, artificial sweeteners and heavy metals, like copper, nickel, palladium, platinum, rhodium, arsenic, cadmium, lead and mercury.[44] Drug manufacturers claim that such ingredients are inert, but this is not the case. These additives (variously called excipients) are biologically active; they can cause reactions which are not being picked up during drug trials, simply because the researchers would not consider 'inert' substances as causing such reactions and would not look for them or factor them into the trial results. Joshua

Pottel, one of the researchers at the University of California at San Francisco, involved in research which examined more than 3,000 excipients used by drug manufacturers, said, "…findings endorse anecdotal evidence that excipients may be the culprits of unexpected physiological effects".[45] The team at UCSF discovered that 38 of these substances interact with human enzymes and receptors. The researchers were "astounded" by the virulence of some of these excipients which, having been used in numerous drugs for years, have completely bypassed detection in safety trials until this research at UCSF. 'Unexpected' physiological effects indeed.

N.B. Some common medications may contain banned E numbers.[46]

Because the harm these excipients can cause isn't always immediately obvious[47], (and consequently not picked up in the initial phases of trials done with animal models) the damage can go undetected or blamed on other factors. These effects can also be compounded if a patient is on more than one prescription medication – there is no research on what effects the combination of such chemicals would have on the patients (and that's before we even consider the actual adverse effects of the medications themselves).[48,49]

In addition to the additives, medications, including certain antibiotics, are considered mitochondria poisons.[50,51] Mitochondria are the tiny "power batteries" found in human cells and perform a variety of crucial chemical and electromagnetic processes vital to life. They are primarily responsible for converting the air we breathe and the food we eat into energy that our cells can use to grow, divide and function. [52,53]

So a Naturopath needs to take into consideration the effect that medications and their additives can have on their client. The best place to check individual medications for ingredients, excipients and adverse effects is the online Electronic Medicines Compendium: https://www.medicines.org.uk/emc/.

I would add here dental metal amalgams (which contain mercury compounds) and white dental fillings, (made from fluoride-containing BPA): all of these are considered neurotoxins (substances which damage the brain and nervous system).

- **Mercury** causes health issues which are well documented.[54]
- **BPA composite fillings** have been found to cause neurodevelopmental issues in children.[55]
- As for **fluoride**, there is plenty of independent evidence to show its detrimental effects on our health.[56]

These harmful substances in our mouths are not inert; they leach into the food we eat as we chew and swallow, so they become very much undesirable additives that affect our gut and consequently our whole body.[57]

Injectable medications (including some vitamin B12 formulations[58], for example), transdermal patches[59] and topical applications (e.g. ibuprofen gel, eye drops) may contain additives which can cause seemingly unconnected health issues such as anaphylaxis[60] or respiratory failure.[61]

Case:

Siblings aged 4 (female) and 7 (male), healthy, normally even tempered and sociable; no history of antibiotics, surgery or trauma; organic diet, natural healthy upbringing; healthy milestones. Parents were advised to have the children attend 6-monthly hospital visits to be assessed for Marfan's Syndrome (one parent has the syndrome). After the third hospital test, the parents observed that both children became uncharacteristically hyperactive and uncontrollable, and also complained they couldn't breathe properly after each hospital visit. Staff at the hospital were friendly and no threatening or other unpleasant associations existed in that setting. When the parents mentioned the children's distress to the hospital staff at the next appointment, it was put down to small children 'playing up'. The parents approached my practice for support. After careful questioning, it transpired that the hospital visit included an eye test where eye drops were administered. The eye drops contained substances which are known to produce some of the symptoms the children exhibited after the visits.

Nutritional **supplements**

Many nutritional supplements (especially cheaper, supermarket varieties, but even high-end ones) contain additives and excipients, similar to those in medications (starch, sucrose, talc, povidone [a synthetic polymer used as a dispersing and suspending agent], magnesium stearate [a flow agent that stops pills from sticking together] and a variety of other undesirable fillers with no nutritional value and much potential harm). Many nutritional supplements, even 'whole-food' ones, contain synthetic variants of vitamins and minerals in forms which the body cannot process properly. Let's take folic acid again: unless it is in a form the body can use (such as folate naturally available in food), synthetic folic acid in supplements can harm the health of those with MTHFR genetic mutations. Estimates are that up to 50% of some ethnicities have at least one of those mutation variants. MTHFR is a gene mutation that is relatively common and is common among people on the autistic spectrum.[63]

A similar issue is encountered with synthetic variants of vitamins A and D which can accumulate in the liver and synthetic vitamin C in its ascorbic acid form: Ascorbic acid exists in two chemical variants which are mirror images of each other: L-ascorbate and D-ascorbate. Most 'cheap' vitamin C on the market is not only derived from GM processes but is made of around 50/50 L- and D-ascorbates. However, whilst L-ascorbate is the beneficial form of vitamin C, D-ascorbate is a gut irritant.[64,65]

As Naturopaths it is important to do our homework before offering our clients any supplement suggestions:

- **Find out if the supplement manufacturer belongs to a big corporation**
- **Examine the supplement ingredients**
- **Ask the manufacturer questions about these ingredients, what the raw materials are and where they come from**
- **Not be misled by terms like 'whole-food', 'natural', 'vegan', etc.**
- **Become familiar with terms like MSDS (Material Safety Data Sheet) and Certificate of Purity (especially in the case of fish oils)**

Other **hidden additives**

This is by no means an exhaustive list of substances hidden in our food which we do not suspect may be harmful. There are many others and most of these we will never see on the package labels:

- **Antibiotics** which are fed to both dairy cattle (finding their way into the milk and other dairy products) and to poultry (and we consume when we eat the meat and eggs)
- **GMO** feedstuffs fed to animals, whose meat and other produce we consume
- **Colourants and vaccines** given to farmed fish – take salmon, for instance. In the wild, a natural diet of krill and shellfish gives salmon its colour, but the farmed salmon available in supermarkets is fed a toxic colour cocktail; without it the

"Dietary carry-over is a term used in food safety that describes the transfer of a feed contaminant to a food product (i.e. the edible tissue of a farm animal). Dietary contaminants that accumulate or biomagnify in the edible part (predominantly fillet in the case of fish)... pose a potential threat to human health. In general, the two main groups of environmental contaminants are Persistent Organic Pollutants ["POPs"] and metals."

fish flesh would be an unappetising grey. Synthetic chemical dyes like canthaxanthin and astaxanthin may be used to colour farm-bred salmon. Canthaxanthin has been linked to aplastic anaemia and loss of night vision. Banned in Australia, is still used in the UK. In its natural form, the carotenoid Astaxanthin, has some health benefits. The synthetic version is made from petrochemicals and not fit for human consumption, yet it is fed to the salmon that we ultimately consume. And all that before we even start talking about all the other contaminants in farmed fish: "Dietary carry-over is a term used in food safety that describes the transfer of a feed contaminant to a food product (i.e. the edible tissue of a farm animal). Dietary contaminants that accumulate or biomagnify in the edible part (predominantly fillet in the case of fish)... pose a potential threat to human health. In general, the two main groups of environmental contaminants are Persistent Organic Pollutants ["POPs"] and metals." [66,67]

- **Pesticides and weedkillers**, such as glyphosate, which find their way into the food chain. There is research to show that glyphosate does not break down harmlessly as originally claimed by its maker, Monsanto. Professor Stephanie Seneff, of the Massachusetts Institute of Technology, has researched tirelessly for many years glyphosate and its role in autism spectrum disorders and other serious health issues.[68] She has repeatedly given dire warnings with regards to its use. Glyphosate has been eventually classed by the WHO as "probably carcinogenic to humans"[69] and recent lawsuits in the USA awarded millions of dollars in damages to people who developed cancer as a result of its use.[70] Note that glyphosate is also found in vaccines.[71,72,73] If ingesting glyphosate causes such harm what does injecting it do?

In conclusion

There is ample evidence that as naturopaths, we should not only guide our clientele to avoid foods with additives wherever possible and only eat foods in their natural state, but also to look to food and medicine additives as potential causative and maintaining factors in ill health. Buying local, seasonal organic, fresh produce and cooking from scratch with pots and utensils which won't leach additional harmful substances in the food (such as aluminium, BPA plastics and non-stick particles), appears to be the best option and can help reduce contamination.

Supporting small local organic growers and lobbying government to ensure foods and medicines become safer, more environmentally friendly and less toxic, must be the most important considerations for us all – if we believe and aim for a sustainable future.

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