



# Food and Depression

» By Sue Dengate, Food Intolerance Network

**D**epression is increasing in developed countries. About one in ten Australian adults are affected by depressive disorders in a given year and about half of all people who develop major depression can expect recurrences.

The standard medical treatment for depression – a combination of therapy and antidepressants – is not particularly effective. Research has shown that the commonly used SSRI (selective-serotonin reuptake inhibitor) antidepressants such as Prozac and Zoloft only work for about 30 per cent of patients and are no more effective than placebo<sup>1</sup>. SSRIs have also been linked to adverse effects including suicide, violence, psychosis, abnormal bleeding and brain tumours.

During the time that depression has been increasing largely in Western countries, our food supply has changed dramatically with the widespread introduction of processed foods in the 1970s.

Reactions to foods have increased, both true allergy – a quick reaction to the proteins in foods such as peanuts – and food intolerance – a delayed reaction to the chemicals in foods such as food additives. Allergy is relatively rare but easier to recognise; intolerance reactions are much more common but difficult to recognise because symptoms build up slowly. Behavioural symptoms are due to intolerance, not allergy – see box below.

## An elimination diet for depression

Although diet is not usually considered as a treatment for depression, an article published in a medical journal in 2002 describes the case of a patient – let's call him John\* – who recovered from his depression using an elimination diet<sup>2</sup>.

John was a 25-year-old university graduate from a stable and caring family. He had a history of attention deficit disorder without hyperactivity, motor tics, generalised anxiety, social phobia, panic attacks and obsessive-compulsive disorder. For the previous five years, John had suffered from severe depressive episodes which did not improve on any medications.

As a last resort John was asked to follow,

for a period of 3-6 weeks, the elimination diet from the Royal Prince Alfred Hospital (RPAH) Allergy Clinic in Sydney. On this diet, patients are asked to avoid about 50 additives in foods and medications, see Box 2. As well, they avoid naturally occurring food chemicals called salicylates (in foods such as citrus, grapes, tomatoes and broccoli; and in medications such as aspirin), amines (in foods such as cheese and chocolate) and glutamates (in foods such as soy sauce, mushrooms and peas). For severe symptoms, patients also avoid dairy foods and gluten<sup>3</sup>.

After four weeks on the RPAH elimination diet, John's mood and other symptoms had improved considerably. Double blind placebo controlled challenge tests showed that John was severely affected by food additives and salicylates. While staying on the diet, John was able to remain symptom-free. When reviewed a year later, John had been able to return to full time work.

Although in John's case the problems were related to additives and salicylates, people differ in what they react to. The Food Intolerance Network, which supports the additive-free low salicylate, low amine diet through an online network of over



6,000 families, has received numerous reports of depression related to a variety of food chemicals.

## Children are affected too

For some people, avoiding depression is as simple as avoiding flavour enhancers (600 number additives). One mother wrote about her 10-year-old daughter who had started experiencing episodes of tearfulness and depression: 'I was amazed when she worked out for herself it was a reaction to sharing her Dad's chips. She told me "It's the flavour enhancers Mum, they just make me want to cry for no reason"'.

Any or all of the additives listed in Box 2 can cause problems in sensitive people. An anxious 7-year-old named Andrew, who did the diet for learning difficulties, ate an icypole with seven artificial colours, BHA (320) and artificial flavours at the end of the diet. Three days later he experienced what his mother described as 'a massive bad and sad reaction'. First, Andrew turned into a monster and no one wanted to have anything to do with him. Then he sank into a deep, dark depression. He wanted to hurt himself, he wanted to be dead. As his mother said, 'It was awful and so dramatic. He was aware of what caused the reaction and never wants to eat one again'. Yet this family, like so many others, had never noticed any effects of foods, because when problematic food chemicals are eaten every day, effects appear to come

## Additives to avoid

None of these additives are permitted in ACO certified organic foods except sulphite in wine.

### Artificial colours

102, 104, 107, 110, 122, 123, 124, 127, 128, 129, 132, 133, 142, 151, 155

### Natural colour

Annatto (160b)

### Preservatives

200-203 sorbates  
210-213 benzoates  
220-228 sulphites  
280-283 propionates  
249-252 nitrates, nitrites

### Synthetic antioxidants

310-312 gallates  
319-320 TBHQ, BHA, BHT

### Flavour enhancers

621 (MSG), also HVP, HPP  
627 disodium inosinate  
631 disodium guanylate  
635 ribonucleotides



Slushies can have a high level of artificial colours and flavours that are high in salicylates.

and go without an obvious cause.

Another family discovered through the elimination diet that their 8-year-old daughter Alicia's depression was linked to amines. Classified as having a highly anxious temperament, pre-diet Alicia was mildly depressed, lethargic, pale, anxious, dizzy and 'spacey'. Her amine challenge resulted in severe depression including bouts of suicidal thoughts and almost psychotic agitation. 'A number of health professionals have told us they expect to see Alicia back during her teenage years, meaning so they can give her antidepressants', wrote her mother. 'However after two years avoiding amines she shows no signs of mental illness in any form and no longer seems a candidate for anxiety and depression.'

## Women at risk

Some people are affected by all of the problem food chemicals. Thirty-eight-year-old Carla suffered depression from the age of 15 and described how she had self-medicated on huge amounts of alcohol. 'I was always very emotional and explosive', she wrote. 'Either I was very "up" or totally down and in a complete mess. When I fell pregnant at age 29, I sank into a deep depression'. After taking Prozac for seven years and unable to come off it, she eventually discovered diet. She describes how she felt on the second day of the salicylate challenge:

'As soon as I woke up I could feel the return of my helpless, hopeless, awful black depression. I couldn't think straight to make even the simplest of decisions. I hated myself and anyone that I loved. It took about five days before I started to come up again. I don't ever want to feel like that again and I know what causes it now. I find the diet very hard in some ways, but I know which I prefer.'

Through the elimination diet, Carla also found that her insomnia was caused by amines, and that glutamates – both natural and as added flavour enhancers – caused tearfulness.

Due to female hormones, women are more at risk of food intolerance during their childbearing years, particularly while premenstrual and after giving birth. Now in her mid thirties, Margaret who described herself as 'a chronic bitch for two weeks out of every month', experienced severe menstrual cramping, heavy bleeding and frequent clots. After her first baby, she suffered from postnatal depression:

'Straight after my son's birth I knew something was wrong. When I got home I just sat in bed staring into space. I couldn't get out of bed, couldn't do anything, couldn't sleep. I would start panicking when I heard

the baby cry. My mother had to come and look after us, doing all the work and bringing my son to me for feeds.'

When her second child was born, the same thing happened, but this time Margaret started the elimination diet for her breastfed baby's eczema when her baby was four months old. It took Margaret 18 months on the diet to wean herself slowly off antidepressants. During that time her PMS, other menstrual problems and depression all disappeared. Food challenges showed that she was sensitive to 'nearly everything'. She says 'If someone had told me when I first got postnatal depression that my problems were due to food intolerance, I would have gone

on the diet straight away.'

Some people are more sensitive than others, and sensitivity to individual food chemicals varies. The elimination diet helps people to find out exactly which food chemicals are related to their symptoms. The Food Intolerance Network ([confoodnet@ozemail.com.au](mailto:confoodnet@ozemail.com.au)) can supply names of supportive dieticians who will supervise a trial of the elimination diet with challenges for treatment of food intolerance-related depression. ◆◆

*\*Names in this article have been changed to protect privacy.*

## Some symptoms of food intolerance

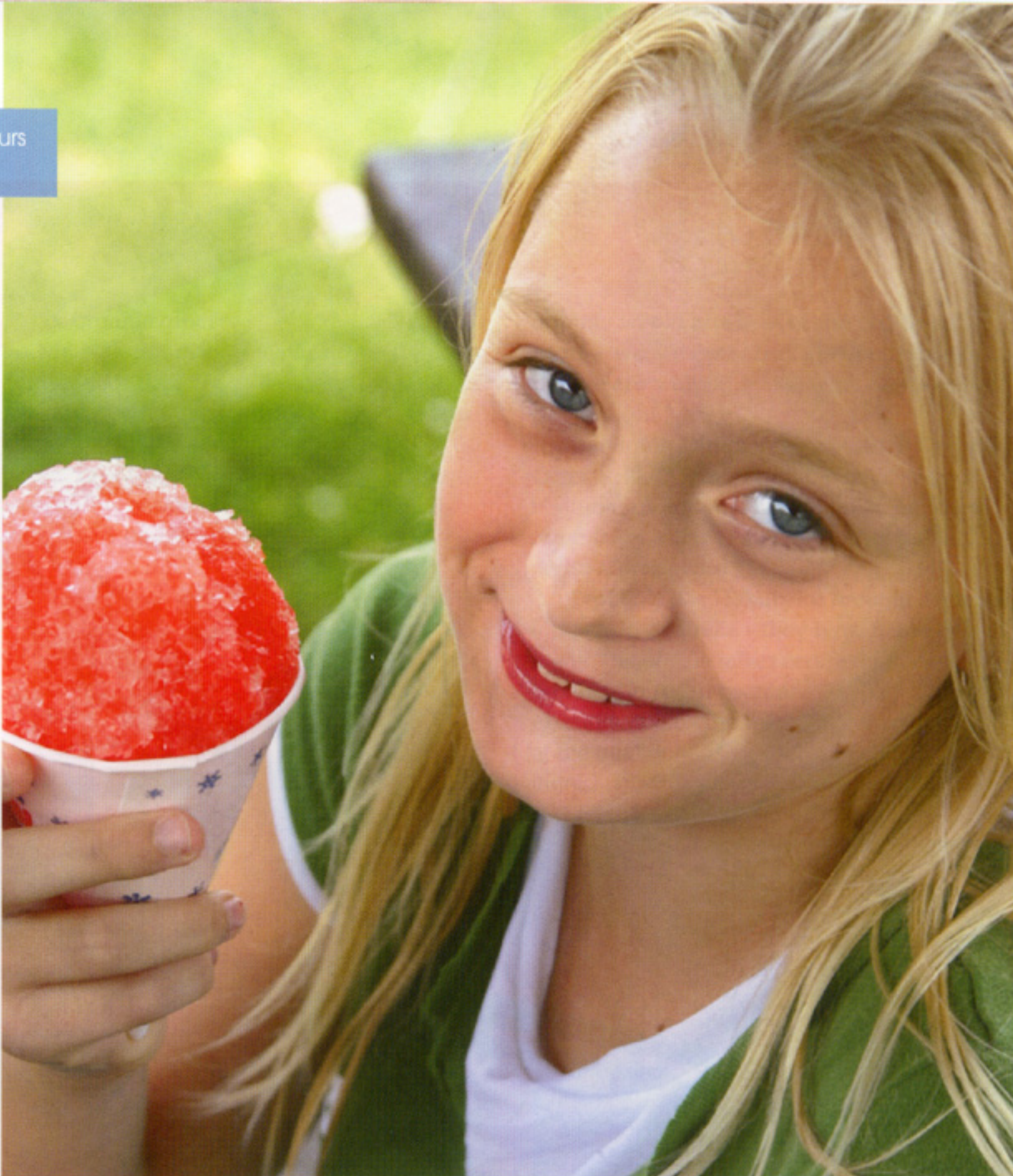
- difficulty falling asleep, frequent night waking
- mood swings, anxiety, depression, panic attacks
- difficulty concentrating, lack of energy
- heart palpitations, fast heart beat
- headaches or migraines
- itchy skin rashes
- irritable bowel symptoms
- asthma, stuffy or runny nose
- irritability
- ADHD-type symptoms

## References

1. Irving Kirsch et al, Initial Severity and Antidepressant Benefits: A Meta-Analysis of Data Submitted to the Food and Drug Administration, PLoS Medicine, February 2008.
2. Parker G, Watkins T, Treatment-resistant depression: when antidepressant drug intolerance may indicate food intolerance. Aust N Z J Psychiatry. 2002;36(2):263-5.
3. Clarke L et al, The dietary management of food allergy and food intolerance in children and adults. Australian Journal of Nutrition and Dietetics. 1996;53(3):89-94.

*Sue Dengate is the author most recently of 'Fed Up: understanding how food affects your child and what you can do about it', Random House, 2008.*

For more information: [www.fedup.com.au](http://www.fedup.com.au)





# Food colours 101

**Should we ban artificial colourings from foods our children eat regularly? The evidence is mixed, but some parents need no more convincing. Helen Signy reports**

It began 20 minutes after James had downed a large bottle of brightly coloured sports drink. Unable to sit still any longer at the class picnic, the Sydney youngster tore off, chasing his sister and her friends with teeth bared and fists hitting out.

That day he bit two children, ran away, and finished the evening in a tantrum of tears, hurling objects around the living room, grunting and moaning like a caged animal.

"It's not me, it's my body," claims the seven-year-old. "When I eat things that are red or yellow it makes me angry."

**THERE'S MOUNTING** concern around the world that food additives, particularly artificial colourings, are to blame for behavioural changes and other health problems in some children.

"Particularly foods that are marketed to children tend to contain these chemicals," says Dr Kerry Phelps, an integrative GP from the Uclinic in Sydney. "I see a lot of cases where people have tried everything. I cut out all the colourings and preservatives from their diet and their children's behaviour transforms."

Artificial food colourings are currently being removed from many foods in the UK, and across Europe warnings are being placed on products that contain them. Is it time to act here?

## **WHAT'S THE PROBLEM?**

Colours have been added to foods for centuries to make them look better and seem more flavoursome. They also serve to offset colour loss due to exposure to light and temperature extremes, and can protect flavours and vitamins sensitive to sunlight during storage.







### Colours that most commonly produce reactions

Food additives are listed on product labels with a name and/or a number.

#### Artificial colours

- 102 tartrazine
- 104 quinoline yellow
- 110 sunset yellow
- 122 azorubine/carmoisine
- 123 amaranth
- 124 ponceau red
- 127 erythrosine
- 129 allura red
- 132 indigotine
- 133 brilliant blue
- 142 green S
- 143 fast green FCF
- 151 brilliant black
- 155 chocolate brown

#### Natural colours

- 160b annatto

A range of artificial food colours is used in Australian foods. In some children who are intolerant to them, eating small quantities may result in hives, irritable-bowel symptoms, headaches, itchy skin rashes and asthma.

Anecdotally, parents have known for years that sweet junk food and fizzy drink can make their children a little hyper – it's usually the sugar that gets the blame. But it wasn't until 2007 that scientific proof emerged that artificial food colourings could be affecting kids, and not just those with ADD.

Researchers at the University of Southampton in the UK studied nearly 300 three-year-old and eight/nine-year-old children to see whether six of the brightest food colours had an adverse effect on their behaviour. They did.

"Artificial colours or a sodium benzoate preservative (or both) in the diet result in increased hyperactivity in three-year-old and eight/nine-year-old children in the general population," the researchers concluded in their study, which was published in *The Lancet*.

The study looked at tartrazine (E102), quinoline yellow (E104), sunset yellow (E110), carmoisine (E122), ponceau 4R (E124) and allura red AC (E129).

"Increased hyperactivity is associated with the development of educational difficulties, especially in relation to reading, and therefore these adverse effects could affect the child's ability to benefit from the experience of schooling," it concluded.

It doesn't mean every child will be affected by eating artificial food colourings – it depends which ones, if any, they are sensitive to and how much they consume.

However, the Southampton study shows that at least some children in the general population will react to the chemicals.



### Natural and hidden dangers

"All natural" on the label is a big selling point. But watch out: potential problems can be hidden.

Natural food colouring can produce reactions in some people too. Annatto (160b), an orange-yellow found in many dairy products, is one to look out for.

Australia has a loophole whereby "composite" foods that

constitute less than 5% of a product don't need to have all their component ingredients listed. And many flavours are permitted in Australia without identification by name or number because they're trademarked; however, they're all assessed as safe by the World Health Organisation.

"Ignore anything on the front of the packet," says Sue Dengate, founder of Australia's Food Intolerance Network. "You have to read and understand the ingredients list. Manufacturers can use names and numbers – people have got used to thinking numbers are nasty, but they don't look at the names."



Sue Dengate, the founder of Australia's Food Intolerance Network, believes the problem has even wider implications because other children in a class of hyped-up kids will suffer from the disruption. "A big majority would be calmer and quieter if we didn't have these things," she says.

## THE INTERNATIONAL RESPONSE

The catch cry in food marketing these days is "clean labelling". People want products that are natural and that contain as few additives as possible.

In response, some multinational food manufacturers are working on voluntarily removing additives, including food colourings, from their products.

Last April, the UK Food Standards Agency, a food safety watchdog with no legislative power, called for the six food colours used in the Southampton study to be phased out in the European Union. An enforceable ban would have to be made by the European Union.

## What you can do

If your child has symptoms, it's important not to self-diagnose, as a range of food chemicals could be causing the problem. See a dietitian who can work out the cause with an elimination diet.

If you're trying to avoid food colours, read all labels closely – colours can be hidden where you least expect them (see "Natural and hidden dangers" box on the opposite page).

Follow a healthy diet full of fresh, unprocessed food and you're less likely to load up on food additives of any kind.

Meanwhile, the European parliament ruled last year that all foods that contain the colours must carry the warning: "May have an adverse effect on activity and attention in children."

In the US, the Centre for Science in the Public Interest has petitioned the Food and Drug Administration to ban a range of colours.

### Lindy Edwards

Policy analyst, Canberra

"MY HUSBAND Tim and younger son Brady are chronic asthmatics – they just manage with puffers. After we cut out food additives, all of a sudden they found they didn't need their preventers any more. When we break the diet, that's when the asthma comes back.

"Brady usually starts to wheeze and cough four to five hours after eating food colours. My husband starts to get itchy all over his body; he feels like his skin's bubbling.

"You have to be well read and treat almost every trip to the supermarket like a researcher. Look at the back of packets, look at the numbers and be aware of which food colourings are the problem ones. There are natural alternatives that manufacturers could use."





## Hidden dangers

An audit released to *HealthSmart* by the Food Intolerance Network has identified the six Southampton colours in 1154 (and counting) Australian products, including: some brands of:

Prawn crackers	Rissoles
Biscuits	Medicines
Cakes and muffins	(including children's and infant cold preparations)
Savoury snacks	Muesli bars
Froot Loops	Hokkein noodles
Pickles	Pies
Ice-cream cones	Toothpaste
Ice tubes	Wasabi-flavoured foods
Dried fruit	
Cordial	
Flavoured natural mineral water	
Flavoured milk	

For the full list, go to [fedupwithfoodadditives.info/features/colours/colourfoods.htm](http://fedupwithfoodadditives.info/features/colours/colourfoods.htm).



### Trudy Miller

Teacher, Yerrinbool, NSW

"MY FIVE-YEAR-OLD SON CONNOR tends to get overexcited when he eats food colours. He's very jumpy. He becomes aggressive, he's defiant, he's rude. It's almost like he's on a drug – he's flying high. When the effect wears off, he hits the ground. There is no control over it. Yellow and red are the worst. It happens within 20 minutes to half an hour.

"Within two weeks of eliminating them, we noticed a remarkable difference – he was a lot easier to reason with, you could settle him down. I was quite surprised to find, once I looked closely at the packaging, how many things did have colours.

"As a parent and teacher, I'd be stoked if the colours were banned. Education is also key. You can read labels, but parents aren't aware of what the numbers mean. I wonder how much better a place school would be if parents were more aware."

## SHOULD FOOD COLOURINGS BE BANNED HERE?

*HealthSmart* examines the main evidence, and arguments for and against a total ban.

### NO BAN

**X** Food Standards Australia New Zealand (FSANZ) works with the World Health Organisation to control additives based on the available science in the context of our local diet. It has ensured we are consuming additives at levels well below the safety limit: that means that even if you ate large quantities of foods containing colourings every day for your whole life, they would not poison you.

**X** FSANZ has found our children eat a lower level of food colourings than that quoted in the UK's Southampton study. "Those colourings are not broadly in the food supply here and aren't in the everyday nutritious foods that children should be eating," says FSANZ spokesperson Lydia Buchtman.

**X** Several local experts have highlighted weaknesses in the Southampton study. They say that while it's interesting research, at this stage there's not enough evidence to prove that

### Lucinda Benson

Mother of four, Brisbane

"WE HAVEN'T had food with colourings in the house for four years. The whole family cut out additives to support our eldest, who has autism. Now, he's 95% normal functioning, a teenager who you would never know was autism spectrum.

"At weekends my husband and I used to eat whatever we wanted if we weren't with the kids. I wouldn't feel terrific, but I thought it was from eating food I wasn't used to. One day I thought, *I haven't had Fanta in ages*. Within half an hour I got the worst screaming headache and it lasted two days. The only way to prove it was to drink Fanta again, so I tried it a week later and exactly the same thing happened.

"Now I know I can tolerate some red, I've never tried blue, and I can't have any yellows. I'm ADHD, and with food colourings I just tend to feel a bit agitated and my concentration goes to pot. I work from home 50 or 60 hours a week and I can't afford not to be able to think clearly, or to have a headache that lasts two days."





artificial colours need banning, says Buchtmann.

**X** Dr Rob Loblay, director of the Allergy Unit at the Royal Prince Alfred Hospital, notes there's no data to suggest food colourings have a long-term adverse affect on children. "There is no current evidence these things cause brain damage," he says. "Whatever effects they are having on susceptible children are transient."

**X** The Australia New Zealand Food Standards Code already requires by law that all additives, including artificial and natural food colourings, must be listed on a product's label.

**X** People are allergic or intolerant to all sorts of things. They can react to natural chemicals found in foods, preservatives and flavours, and different combinations of chemicals. Everyone is affected differently.

**X** The effects of food colourings are dose-dependent – if your child reacts to food colours, then give them less of those foods.

**X** Consumers would baulk at food without colourings. Can you imagine drinking a clear but orange-tasting fizzy drink?

## YES, LET'S BAN

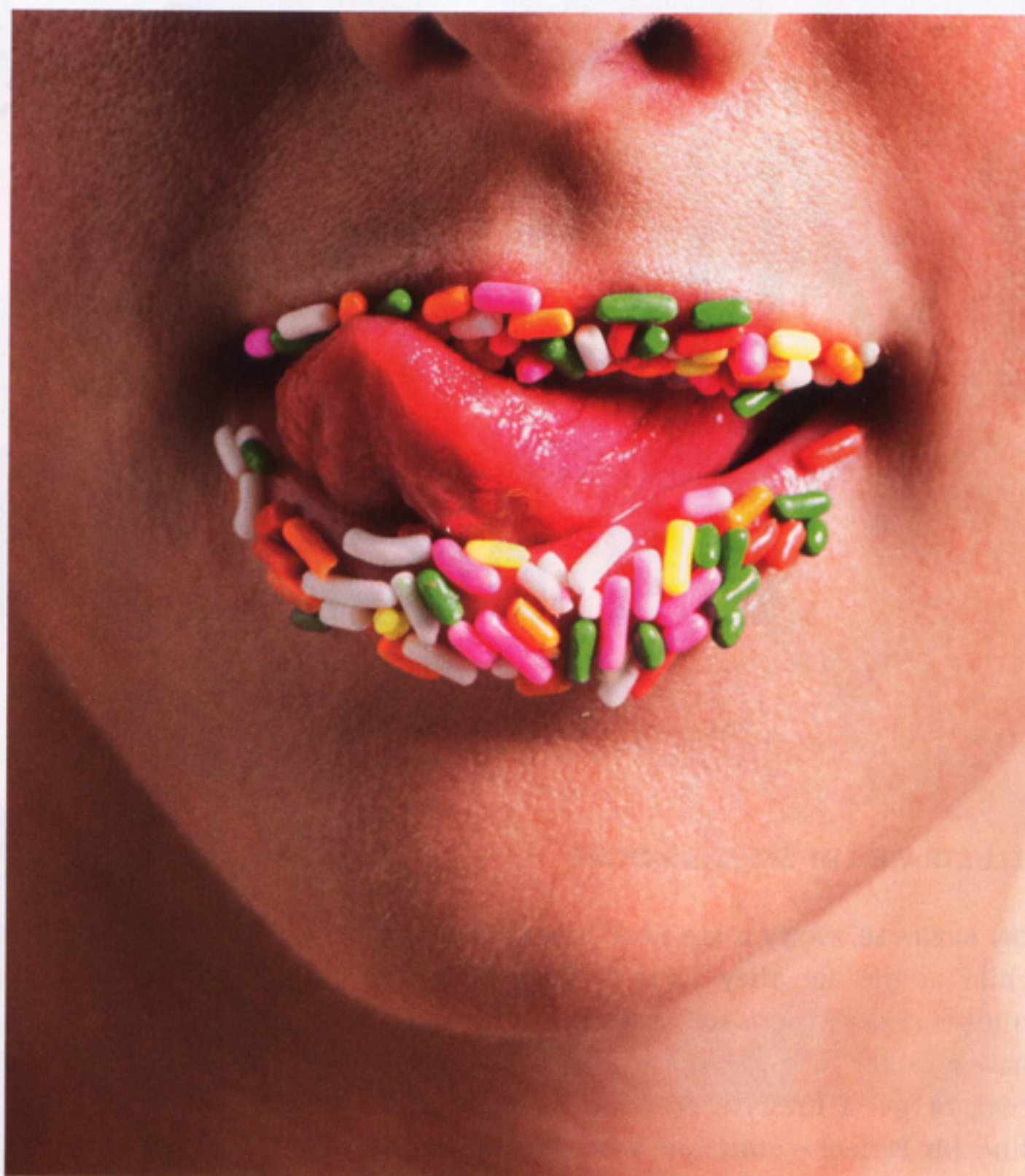
**✓** The Southampton study proves that children in the general population – not just children with known allergies and intolerances – are affected by food colourings.

**✓** You wouldn't ban peanuts just because some children are allergic to them: they are healthy and beneficial for most people. However, artificial colours have no nutritional benefits at all. They are used for cosmetic purposes only, and no-one would suffer if they were banned.

**✓** Children – especially young ones – can still be affected by food colourings even if they consume far less than the current acceptable daily limit.

**✓** Anecdotal evidence from parents is strong enough to warrant tighter regulation of food colourings, says NSW Greens MP John Kaye. "Everywhere I go, parents talk to me about kids reacting," he says. "FSANZ says it's up to parents to take care to minimise their children's consumption. But that means memorising six three-digit numbers. That's not realistic."

**✓** Artificial colours can be replaced by natural food colours. Manufacturers argue that it might be more expensive, "but what's more important, bright colours or bright kids?" asks Sue Dengate. +



**Artificial colours have no nutritional benefits at all. They are used for cosmetic purposes only**

## The great Smartie showdown

**NESTLÉ AUSTRALIA** announced in December 2008 it was removing artificial food colourings from the casings of Smarties – but to do so wasn't an easy feat.

In the UK in 2005, the company saw a consumer backlash when it took out blue Smarties because a vibrant natural blue colour couldn't be found, says Andrew McIver, general manager of confectionery and snacks for Nestlé Australia. The problem with replacing artificial colours is retaining the quality of colour and flavour, he says. "You get a really mottled colour. For a long time we couldn't technically achieve it in Australia."

There's also the problem of cost: some natural alternative can be 40 times more expensive.

The Australian Food and Grocery Council also points out that natural colourings are not without risks: some people are sensitive or allergic to natural colourings such as cochineal.

However, the industry realises there's increased consumer perception that natural colourings are safer, so expect to see a higher number of manufacturers moving towards more natural, less synthetic food colourings as technology improves.



# *Avoiding harmful food additives*



Presented by  
Sue Dengate BA Dip Ed  
Howard Dengate BSc PhD





# Food Intolerance Network

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- membership: over 6000 families
- over 1.5 million website visitors
- over 1000 visits per day
- 15 years of case reports in database

[www.fedup.com.au](http://www.fedup.com.au)





# The science



See scientific references under Talks on [fedup.com.au](http://fedup.com.au)

- RCTs – gold standard but influenced by funder
- Case reports – previously ‘undervalued’, important for adverse reactions
- Adverse reactions monitoring (e.g. FDA) not used in Australia





# FSANZ factsheet



**“Adverse reactions to foods and food additives occur in *a small proportion of the population*. These reactions are *not the same as allergies* but may include *rashes and swelling of the skin, irritable bowel symptoms, behavioural changes in children and headaches*.”**

**[www.foodstandards.gov.au](http://www.foodstandards.gov.au) *(our italics)***





# Allergy or intolerance?

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Allergy: quick – proteins

e.g. itching, swelling, breathing, diarrhoea

- rare, obvious, laboratory tests

Intolerance: delayed - chemicals

e.g. headaches, behaviour

- common, not obvious, elimination

Ref: Clarke et al, Aust J Nutr Diet, 1996





# Adverse reactions to additives



- skin rashes: eczema, hives, swelling, itching
  - irritable bowel symptoms: reflux, constipation and/or diarrhoea, stomach aches, bloating, nausea, bedwetting, sneaky poos
  - behavioural changes: irritability, restlessness, inattention, hyperactivity, oppositional defiance, mood swings, difficulty falling asleep, frequent night waking, night terrors, restless legs
  - headaches & migraines
  - asthma
- See website references



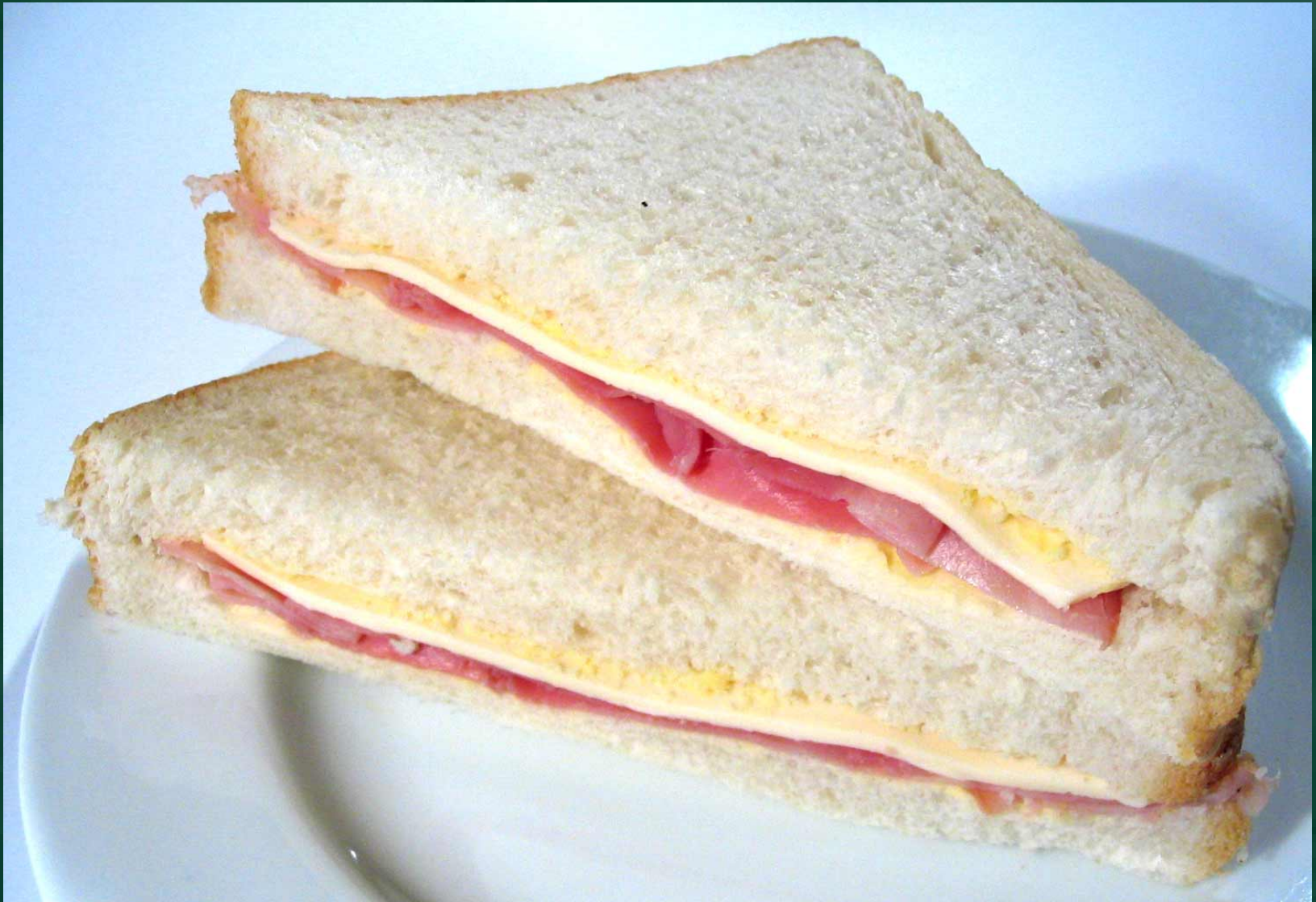


# Additive consumption



- reactions to additives are related to dose
- additive consumption has increased since the 1970s
- a 2007 survey showed that consumers considerably underestimated additive intake





282, 319, 223, 320, 202, 160b, 200, 250, 220, 635





# 50 additives of concern



## Colours

102, 104, 107, 110, 122-129, 132, 133, 142, 151, 155

Natural colour 160b

Preservatives	sorbates	200-203
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	benzoates	210-213
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	sulphites	220-228
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	nitrates	249-252
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	propionates	280-283
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Synthetic antioxidants	310-312, 319-321
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Flavour enhancers	621, 627, 631, 635
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Flavours	unregulated
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# Artificial colours



- 1<sup>st</sup> reports in 1970s; synergistic effect 2005
- 2007: Southampton study: general population affected – colours can reduce “ability to benefit from schooling”
- UK - voluntary ban on 6 colours
- EU warnings - "may have an adverse effect on activity and attention in children"

**McCann et al Lancet 2007 & see website references**





# The analogy with lead

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- The size of the effect of food additives was found to be “very close” to the size of the effect of lead on children’s IQ in the 1980s - Prof J Stevenson

<http://www.food.gov.uk/multimedia/pdfs/board/fsa080404a.pdf>





# How many are affected?

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- According to FSANZ – without evidence - only “a small proportion”
- In a UK study in 2003, when an entire class of 6 year olds went additive free for 2 weeks, nearly 60% improved
- Similar results from 3 additive free trials in NSW

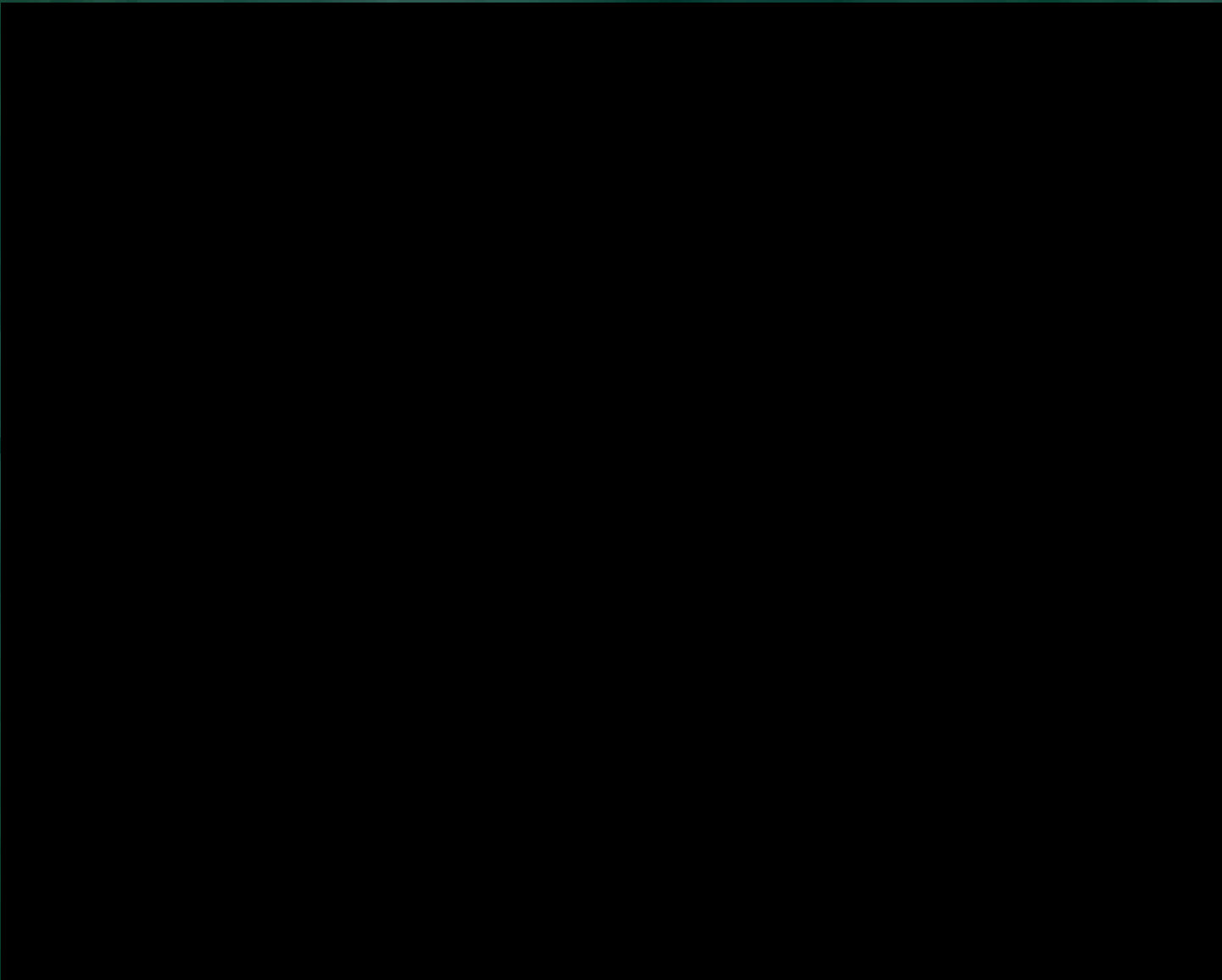
See website references



# NSW school trials











# Sugar



- **contrary to public opinion, sugar does not cause children's behaviour problems**
- **children who appear to be reacting to sweet foods are affected by additives**
- **... and/or salicylates**

**See references on website**





# Natural colours



- used increasingly in the UK
- not tested for behavioural effects
- so far only annatto (160b) causes problems
- betacarotene (160a) is a safe alternative
- rare allergies to cochineal (120) and annatto

See references on website





# Benzoates (210-213)

- used in drinks, toppings, syrups, medications
- phased out of Diet Coke in the UK
- linked to hyperactivity in children
- can break down to form benzene (carcinogen)
- linked to cell damage (ageing, Alzheimers)
- asthma, eczema, urticaria, rhinitis
- ADI exceeded by young high consumers in Australia

See website references





# Sulphites (220-228)



- associated with all food intolerance symptoms especially asthma
- WHO - estimate of sulphite sensitive children – recommend reduced sulphite use
- ADI exceeded in high consuming children
- sulphites in mince

See website references





# Propionic acid and other propionates (280-283)

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- mould inhibitor used in bread etc
- effects of propionic acid build up
- chemically induced propionic acidemia
- children's behaviour
- alternative: hygiene

Brusque et al, Pharmacol Biochem Behav, 1999

Dengate & Ruben, J Paediatr Child Health, 2002





# Synthetic antioxidants

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- BHA (320) and BHT (321) – first associated with hyperactivity in 1970s
- TBHQ (319) and gallates (310-312)
- natural antioxidants based on vitamin C and vitamin E are behaviourally safe (300-309)
- BHA ‘reasonably anticipated to be a human carcinogen’ – NTP
- often unlisted ...

See website references



**The 5% rule:** if the amount of an ingredient in a food is less than 5%, an additive in that ingredient does not have to be listed if it no longer performs a technological function







# Flavour enhancers



- MSG (flavour enhancer 621)
- yeast extract, autolysed yeast, hydrolysed protein, hydrolysed vegetable protein, HVP, HPP, soy protein
- new group: nucleotides (627, 631, 635)

See website references





**See the website Ribo rash factsheet**





**See the website Ribo rash factsheet**





# Flavours



- associated with hyperactivity
- salicylates
- natural vs artificial
- size of dose





# Avoiding additives

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- additives of concern
- types of reactions
- numbers affected





# Strategies to avoid harmful additives

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- simply remove them and increase sales
- increase use of known safe additives – see [Factsafeadditives.htm](http://Factsafeadditives.htm)
- consider more aseptic packaging, dimethyl dicarbonate (242) for liquids
- don't simply switch from one harmful additive to another





# Next steps in regulation and monitoring



## Future approval processes:

- must include criteria on behaviour and learning effects
- must consider the full range of food intolerance symptoms
- should include additives in combination rather than singly
- must listen to consumers



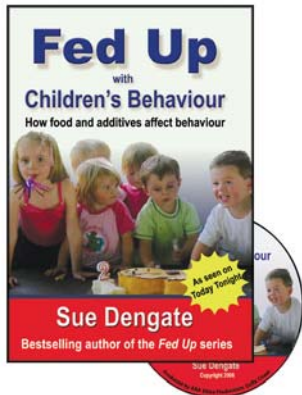
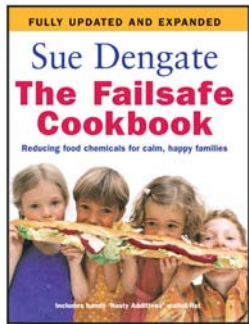
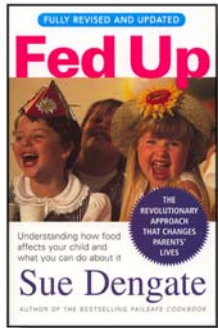


# Culture of care: EU vs Australia

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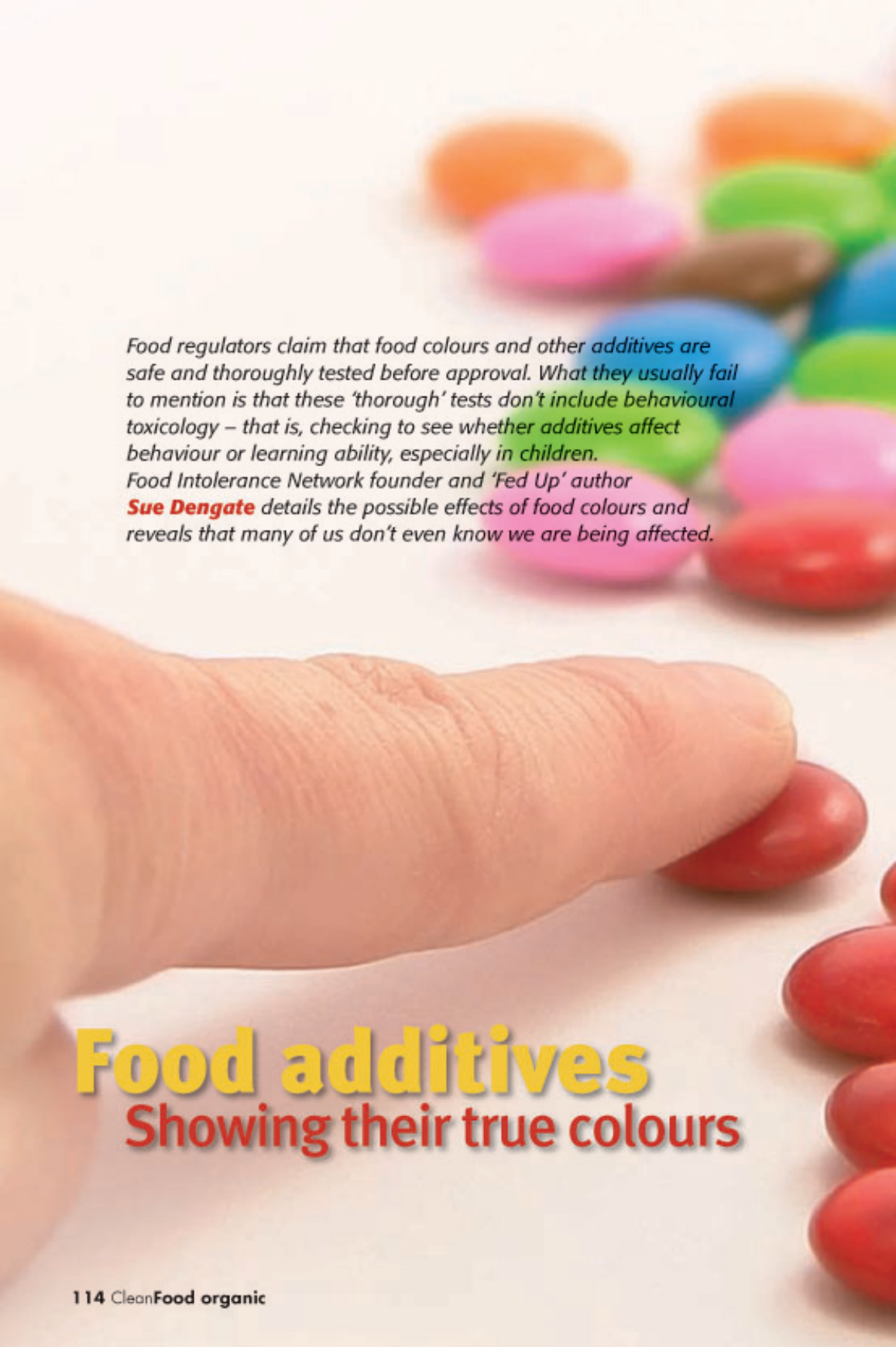
- artificial colours require warning
- lower Maximum Permitted Levels
- '5% rule' abolished
- health warnings if used in medication
- products with artificial colours
  - Sweden 34
  - Austria 119
  - Denmark 344
  - UK > 1000
  - Australia ?





# More information

[www.fedup.com.au](http://www.fedup.com.au)



*Food regulators claim that food colours and other additives are safe and thoroughly tested before approval. What they usually fail to mention is that these 'thorough' tests don't include behavioural toxicology – that is, checking to see whether additives affect behaviour or learning ability, especially in children.*

*Food Intolerance Network founder and 'Fed Up' author **Sue Dengate** details the possible effects of food colours and reveals that many of us don't even know we are being affected.*

# Food additives

## Showing their true colours







Since the consumption of processed food became widespread in the 1970s, regulators have simply ignored the behavioural aspect of food additives. This changed dramatically in April 2008 when UK food regulators recommended a 'voluntary' ban on the use of six artificial colours due to their effects on children's behaviour and learning. For the first time officials had taken behavioural toxicology seriously.

### What are artificial colours?

The processed food industry as we know it started in the US in the 20th century with the discovery of refined pectin that enabled jams and jellies to be made cheaply just from sugar and water. Artificial colours and flavours were used so that real food such as fruit could be left out, thus reducing costs. Originally, artificial colours were made from coal tar. Although now made synthetically, artificial colours are still often referred to as coal tar dyes. Of these, dyes with a particular chemical structure called *azo* are the most likely to cause asthma, urticaria and allergic rhinitis (hayfever) in susceptible consumers. Azo dyes were the first additives to be recognised as harmful and a number have been banned for carcinogenicity. Some researchers suspect that all azo dyes are possible carcinogens. Other adverse effects of artificial colours include allergic reactions such as anaphylaxis to patent blue (131) and indigo carmine (132) when used as diagnostic agents to colour lymph vessels.

### Natural colours

Due to a consumer backlash against artificial colours, food scientists are constantly searching for new colours from natural sources such as plants, animals or minerals. Many new colours have been introduced into our food supply in the last ten years and the discovery of a new colour for natural blue Smarties in the UK has been announced with much publicity. It is described as a seaweed derivative produced from two species of cyanobacteria (blue-green algae). Natural colours cost more because the materials for them have to be grown instead of made in a laboratory. According to the food industry, so much colour is used in manufactured foods in the US that it is not possible for all colours to be derived from natural sources. Some of the colours listed below such as 160d, 160e and 172 can be made synthetically.

The 'natural' label is no guarantee of safety. Natural colour annatto 160b can cause the same range of adverse reactions as artificial colours. In one study of 60 patients with urticaria, more were affected by annatto than any artificial colour. Anaphylaxis to annatto has been reported in the medical literature. As well as causing children's behavioural problems, asthma and skin rashes, this colour seems to be associated with head banging in young children, a condition never mentioned in parenting books prior to the 1970s, yet now considered to be a normal stage of development. Older children are



sometimes able to explain that their previous head banging was to relieve severe headaches caused by annatto.

## Colours in organic foods

Natural colours are not necessarily suitable for use in organic foods because under organic standards the term 'natural' means that both the source and extraction process have to be natural. As well as the chemicals used in processing, other concerns about natural colours include the possibility of genetically modified ingredients and the five per cent labelling loophole, which means that if other additives such as preservatives are used, they do not have to appear on the ingredient list because the colour additive forms less than five per cent of the final product. There is also debate about the safety of various ingredients such as aluminium and the possible presence of salicylates in colours derived from plants for people who are salicylate sensitive.

Adverse effects of chemicals are related to dose. Although the colour exists in nature, when concentrated extracts are used, it may be possible to consume much higher doses than in natural food. For example, excessive doses of canthaxanthin (161g) are known to cause retinal spotting, sensitivity to glare, impaired

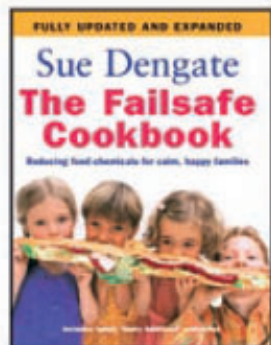
twilight vision and delayed dark adaptation. The small amounts used as food colours in pickles, sauces, confectionery and fish farms are considered safe by regulators, but some researchers have expressed concerns about extreme consumers.

Of all colour additives, caramel colours are by far the most common, accounting for about 98 per cent of all colouring matter added to products. You can find them in a wide range of foods and drinks including cola drinks, gravy and other brown foods, brandy and whisky.

## Colours in medicine

When reading labels on medication, you need to be aware that medication with 'no azo dyes' may contain other potentially harmful colours. Since colours are regarded as 'inactive' ingredients, regulations regarding pharmaceuticals including medications, vitamins and supplements do not require colours to be listed on the label. You can usually find a description of the colours on the CMI (Consumer Medicine Information) sheet available from pharmacists or on the Internet: [appgonline.com.au](http://appgonline.com.au)

However, these do not always give enough information. For example, if your medication lists Opalux or Opadry colours, these could contain tartrazine (102), sunset yellow (110),



*The Failsafe Cookbook and Fed Up* have opened the eyes of thousands of desperate parents to the adverse effects of synthetic additives and natural chemicals in foods.

Now fully revised and updated.

'A reminder to all parents to take a closer look at what their children are eating' *The Age*



see [www.fedup.com.au](http://www.fedup.com.au) for more information

erythrosine (127), indigo carmine (132) or brilliant blue (133). You need to find out more about the ingredients of those products – see more information to follow or do an Internet search.

## Those most at risk

Your exposure to colour additives depends on where you live. Additives intake varies from

many per day in westernised countries to none for millions of people in subsistence villages. Food manufacturers change ingredients frequently and even in global brands the use of additives varies. Traditionally, English-speaking countries, especially the US, Canada, Australia, New Zealand and the UK, have been more accepting of additives than European populations but that has changed with the

## Natural colours

- 100 curcumin – turmeric
- 101 riboflavin – vitamin B2
- 120 cochineal – from beetles, can cause allergies including anaphylaxis
- 140 chlorophyll – green colouring in plants, e.g. spinach
- 141 chlorophyll copper complexes
- 150a caramel I plain caramel
- 150b caramel II caustic sulphite caramel
- 150c caramel III ammonia caramel – possible immunotoxicity especially if vitamin B6 intake is low
- 150d caramel IV sulphite ammonia caramel – possible gastrointestinal symptoms in large doses
- 153 carbon black – carbon from vegetable matter, some concerns about possible carcinogenesis
- 160a beta carotene – from carrots, other vegetables and fruits
- 160b annatto – from the seed coat of a tropical tree, full range of intolerance and allergic effects
- 160c capsanthin – paprika extracted from peppers
- 160d lycopene – tomato extract
- 160e carotenal – found in tomatoes, pink grapefruit
- 160f carotenoic esters – one of the carotenes from plants
- 161a flavoxanthin – found in calendulas
- 161b lutein – found in green leaves, marigolds, egg yolks, used to feed hens
- 161c cryptoxanthin – found in gooseberries, orange rind, egg yolk, butter
- 161d rubixanthin – found in rosehips
- 161e violoxanthin – found in yellow pansies
- 161f rhodoxanthin – found in the seeds of yew trees
- 161g canthaxanthin – found in mushrooms, crustacea, flamingo feathers, also synthetic; possible twilight vision impairment in large doses; used in foods such as confectionery, pickles, also in fish farms
- 162 beet red – beetroot extract
- 163 anthocyanins – extract of grapeskin or similar
- 164 saffron, crocetin, crocin – from crocuses
- 170 calcium carbonate – limestone, chalk, also used as a calcium supplement
- 171 titanium dioxide – possible concerns regarding nanoparticles
- 172 iron oxides red, yellow, orange, brown, black – debate concerning possible toxicity
- 173 aluminium – surface decoration only, possible concerns about neurotoxicity not proven
- 174 silver – possible adverse effects from large doses
- 175 gold – considered very safe
- 181 tannins – from nut galls, considered safe in small doses as additives in wine and other alcoholic drinks





**Children are not the only ones affected by food colours. In 1999, English health officials investigating a number of complaints about asthma and other allergies from patrons of popular curry restaurants found more than half the dishes surveyed contained excessive use of artificial colours tartrazine (102), sunset yellow (110) and ponceau 4R (124).**

UK now pressing for change. Paradoxically, while western consumers are moving to reject artificial additives, developing food processing industries in countries such as Nepal are starting up with cheap, highly coloured products such as artificial jams.

### **Colours and ADHD**

For more than 30 years, researchers and parents have been reporting behavioural effects of additives, from American paediatrician Dr Ben Feingold who blamed hyperactivity on diet in 1975, to independent scientists at the CSPI (Center for Science in the Public Interest) who recommended a ban on artificial colours in their 1999 report, 'Diet, ADHD and behaviour: a quarter century review'. Despite the failure of many early studies to show adverse effects, in 2004 a large review of careful scientific studies showed a significant effect of food additives on children with ADHD (attention deficit hyperactivity disorder). So why the turnaround

now? The answer is the Southampton University Study.

Led by psychology Professor Jim Stevenson, the study was funded by the UK Food Standards Agency and published in the leading medical journal *The Lancet* in September 2007. During the investigation, 300 children in two age groups were given drinks containing a high concentration of additives, an average concentration of additives or a placebo with no additives at all. The results showed that the highest concentration of additives affected the children the most. More importantly, the study showed that children without ADHD could be affected. Regulators who were used to ignoring complaints because they thought only a few children were affected now heard from researchers that artificial colours could cause 'psychological harm' to normal healthy children and that the number of children with ADHD could be reduced by about 30 per cent if the additives were banned.



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## Is your child affected and you don't know?

People might think that parents would know if their children were affected by food additives but that's not what happens. The Southampton University study found that food additives can contribute to hyperactive behaviours – namely, overactivity, inattention or impulsivity. Previous research has shown that parents are not particularly good at recognising hyperactive symptoms in their own children. Yet these symptoms can be of vital importance in the long term. According to the Southampton team, food additives could affect a child's ability to benefit from schooling because increased hyperactivity is linked with educational difficulties, particularly reading, and reading difficulties can be associated with lifelong problems including lower income. Effects of additives can occur hours or even

days after they are eaten, so unless a parent is watching carefully, they are unlikely to make the connection.

There have been very few additive-free trials carried out in schools. In the only trial reported in a scientific journal, 803 New York schools removed 14 artificial colours, two preservatives (BHA 320 and BHT 321) and sugar from school meals over a period of four years. The result was a 16 per cent increase in academic ranking compared to the rest of the nation's schools and a significant decline in children classified as learning disabled, from more than 12 per cent to less than five per cent. Sugar has subsequently been found not to affect children's behaviour or learning ability. However, when schools reduce additive intake, they generally report that students are calmer and more cooperative.

### Some possible effects of food colours

- \* irritability, restlessness, difficulty falling asleep, symptoms of ADHD
- \* mood swings, anxiety, depression, panic attacks
- \* inattention, difficulty concentrating or debilitating fatigue
- \* speech delay, learning difficulties
- \* headaches, migraines, head banging in young children
- \* eczema, urticaria (hives) and other itchy rashes
- \* angioedema or swelling of the lips and so on, often associated with rashes
- \* reflux, colic, stomach aches, bloating and other irritable bowel symptoms including constipation and/or diarrhoea, sneaky poos, sticky poos, bedwetting
- \* frequent colds, flu, bronchitis, tonsillitis, sinusitis
- \* asthma, stuffy or runny nose, constant throat clearing, persistent cough
- \* joint pain, arthritis
- \* heart palpitations, racing heartbeat

## How many additives do you eat?

The problem for parents is that most consumers aren't aware of the additives they eat. Foods have changed so much over the last 30 years that additives are now used widely even in healthy foods such as bread, butter, yoghurt, juice or muesli bars as well as in junk food. A British survey in 2007 found that most consumers don't know which foods contain additives and underestimate how many additives they eat. On average, consumers eat 20 additives per day, or 19 additives per day if the foods they eat are home cooked. When additives are eaten many times a day every day from early childhood, parents will never know what additive-free behaviour is like.

In the US, where artificial colours are widely used, a desperate mother discovered that both her breastfed baby's sleep patterns and her toddler's behaviour improved when she avoided tartrazine (102). She had been eating tartrazine herself and feeding it to her two-year old in potato bread, yoghurt, canned soup, margarine, cough syrup, cakes, cake mixes, donuts, muffins, snack cakes, ice-cream, cookies, crackers, drink mixes, lemonade,

pudding mix, boxed meals, rice and pasta dishes, cheesecake, butterscotch candy, jelly and chips.

## Adverse effects of artificial colours

Behaviour isn't the only effect of food colours. Long before children's behaviour became an issue, a range of symptoms had been associated with various additives including colours.

In the early 1950s, virtually the entire world population was on a low-additive diet. It is easiest to notice effects of additives when they are eaten only occasionally. As processed foods gradually became common, additive intakes increased. One of the earliest adverse reaction reports – six cases of childhood asthma associated with various artificial colours – was published in 1958. The next year, a report of reactions to tartrazine (102) in drugs appeared. Eight years later a case of severe, chronic asthma was linked to tartrazine in yellow vitamin tablets. These were followed by increasing reports of reactions to food colours and other additives. By the 1980s,

food additives were common. When additives are eaten every day, you don't see reactions. Instead, you see a chronic condition, or symptoms that come and go with no apparent cause. Research shows that the effects aren't obvious unless a reaction occurs within 30 minutes.

Babies and young children are most at risk from food additives because they eat and drink more relative to their body weight than adults. Even breastfed babies can be affected by additives because artificial colours and other food chemicals can pass through breastmilk. A young fully breastfed baby in Brisbane with an asthmatic cough subsequently developed wheezing and breathing problems at age four months on coloured antibiotics. He was medicated constantly for asthma for two years until the Royal Prince Alfred Hospital (RPAH) elimination diet showed that his asthma was related to a range of artificial colours, one natural colour (annatto 160b) and certain preservatives. Additives can also be absorbed through the skin. Through experience, his family learned that his asthma was related not only to colours in foods but also to toothpaste, shampoo and playdough with artificial colours.

### Where the colours are

- sweets, bubblegum, chocolates
- cakes and biscuits including cream biscuits, wafers, ice-cream cones
- jellies, custard powders
- drinks including cordials, fruit-flavoured drinks, sports drinks, flavoured milks, icy poles
- topping syrups and milkshake flavouring
- packet savoury snacks including burger- or cheese-flavoured snacks, prawn crackers
- spices, tandoori mix, chutneys
- ready-made desserts such as custards, creme caramel
- takeaways including battered or crumbed fish
- medications and supplements
- personal care items from toothpaste to teeth-ing gel, antibiotics to vitamins, cough drops and antihistamines to protein powder supplements

### Worst-case scenario

Anaphylaxis is a sudden allergic reaction involving at least two systems of the body such as the respiratory tract, skin, gastrointestinal tract or cardiovascular system. Symptoms usually occur within minutes to several hours after contact with the trigger. Reactions can range from mild to severe and life threatening. Asthmatics with a history of allergy have a particularly high risk of anaphylaxis.

In 1981, a medical journal described the case of a 25-year-old asthmatic medical student who experienced several sudden life-threatening attacks involving tightening of the throat, shortness of breath and hives over a few months which were eventually traced to foods and drugs coloured with tartrazine (102). His doctor commented that 'in spite of careful





### Colours linked to intolerance reactions

Colour	FD&C No	Colour Index (CI)	Azo	Comment
E102 tartrazine yellow	Yellow #5	19140	Yes	UK ban recommended, banned in Finland, restricted use in Sweden and Germany
E104 quinoline yellow	Yellow #4	47005	-	UK ban recommended, banned in the US and Japan, Australian ban lifted in 2003
E107 yellow 2G	-	18965	Yes	Not in food in Australia
E110 sunset yellow	Yellow #6	15895	Yes	UK ban recommended, banned in Finland and Sweden
E122 azorubine/ carmoisine (red)	-	14720	Yes	UK ban recommended, banned in the US
E123 amaranth	Red #2	16185	Yes	-
E124 ponceau red	Red #4	16255	Yes	UK ban recommended, banned in the US, Canada, Sweden and Japan
E127 erythrosine red	Red #3	45430	-	-
E129 allura red	-	-	-	UK ban recommended
E131 patent blue V	-	42051	-	Diagnostic agent only
E132 indigo carmine	Blue #2	73015	-	-
E133 brilliant blue	Blue #1	42090	-	-
E142 food green	-	44090	-	-
E143 fast green	Green #3	42053	-	Banned in EU
E151 brilliant black	-	28440	Yes	-
E155 chocolate brown	-	20285	Yes	-
E160b annatto	-	75120	-	Natural colour

screening by an alert, educated patient', the student had suffered two more moderate attacks after eating foods later found to contain tartrazine. Such reactions to additives are rare but frightening for the families involved because colours are so widespread. The parents of a NSW preschooler who suffered similar reactions to tartrazine in 2007 were advised to carry an EpiPen® adrenaline injector at all times and to keep their child away from all azo dyes, including playdough, requiring allergy awareness at school and in everyone who ever cares for their child.

## Allergy or intolerance?

Allergic reactions are generally quick reactions to the proteins in a few foods, involving symptoms such as itching or swelling. They are relatively easy to identify and can be confirmed by laboratory (IgE) testing. Most reactions to food additives are not this kind of reaction. Instead, they are intolerance reactions to chemicals, usually delayed, with a wide range of symptoms and many foods involved. Intolerance reactions can be extremely difficult to identify. There are no proven laboratory

tests for food intolerance and the way to confirm reactions is through elimination and reintroduction of the various chemicals.

Food regulators are in the difficult position of looking after the interests of both food manufacturers and consumers. Manufacturers like artificial colours because they are cheap and effective and, until now, food regulators have supported them. The US FDA (Food and Drug Administration) denies that artificial food colours cause problems other than hives in a pamphlet on food colours written by the food industry. Australian food regulators continue to deny behavioural problems in children, saying the science is 'weak'. Breaking this cycle, when announcing the UK food regulators call for a ban on artificial colours, Food Standards Agency Chair Dame Deidre Hutton announced it was 'time to put consumers first'.

Artificial colours are not the only additives than can affect children but they are cosmetic, used in foods targeting children, unnecessary and the easiest to remove, as can be seen by how well UK manufacturers have already adapted. Nestlé Rowntree in the UK experienced a nine per cent increase in sales after switching its iconic Smarties brand to all natural colours in 2006.

When food additives are dropped, it is usually due to consumer demand, not regulation. In the UK, the five largest supermarket chains have promised to remove artificial colours from their own brands, the UK branches of giant confectionery makers such as Cadbury and Mars Inc have pledged to remove artificial additives and many other firms are following suit. Support for an outright ban on artificial colours has also come from the Daily Mail 'Ban the Additives' campaign, [actiononadditives.com](http://actiononadditives.com) and other community organisations.

Australian consumers who would like to see a reduction in artificial colours can register their opinions by emailing manufacturers directly through the Contact Us option on company websites. For more information and references, see [fedupwithfoodadditives.info/factsheets/Factcolour.htm](http://fedupwithfoodadditives.info/factsheets/Factcolour.htm)

## Consumer colour backlash

In 1976, public outcry forced the Mars confectionery company to remove red M&M'S® from its traditional colour mix after the US Food and Drug Administration (FDA) banned the use of the red dye Amaranth Red#2 as a food additive as it proved to be carcinogenic in laboratory animals. Amaranth Red#2 was not actually used to colour the product but Mars thought it best to withdraw the colour anyway.

Red M&M's were reinstated with much fanfare in 1987, and are coloured with Cochineal (120). Cochineal (120) pink colouring – made from crushed beetles – is a natural colour that can cause severe problems. This colour does not cause food intolerance reactions such as hyperactivity and can be one of the safest colours for susceptible children. However, cochineal has been associated with rashes, breathing difficulties and life-threatening anaphylaxis.



# Conventional processed foods leave a bad taste

*Laboratory-made flavour additives became widespread during the 1960s with the burgeoning popularity of processed convenience foods. Now it's hard to find a conventionally produced food product that doesn't contain added flavours and flavour enhancers.*

**Sue Dengate** takes a close look at 'natural' and 'artificial' flavours and discovers that one isn't necessarily better for you than the other.

Consumers who read food labels are often surprised to see that there are added 'flavours' in most products. If, like many people, you think natural flavours are good and artificial flavours are bad, you need to know more about these additives.

Flavours are used in processed food because overprocessing destroys flavour. When you drink freshly made juice, it needs no added flavours. But by the time apple juice, for example, has been centrifuged, pasteurised, filtered, clarified and cold-stabilised, much of the original flavour has been lost.

Until recently, Australian food labels followed the European tradition of describing flavours as natural, artificial or nature identical. For example, a strawberry-flavoured yoghurt could contain:

- natural flavouring substances whether derived from strawberries or not
- a nature identical flavouring substance that has been synthesised, but is chemically identical to a substance found in nature, or
- an artificial flavour that has been synthesised and has not yet been

identified in any natural product.

While you can still find these terms on some product labels in Australian supermarkets, the labelling regulations changed in 2002 so, technically, the term 'natural flavours' does not now comply with the code.

Under the new regulations, flavours must be declared in the ingredient list as either 'flavour' or 'flavouring', or as a specific name or description of the flavouring, such as 'vanilla'. There's no mention of natural or artificial, and although the food manufacturers know whether they are using artificial flavouring substances, the consumer does not. Should you be concerned?

## Butter flavour and lung disease

The butter flavour diacetyl – used in products such as microwave popcorn – has been linked to a rare and deadly respiratory disease known as Popcorn Workers Lung. Its victims include young, healthy, non-smoking flavouring industry workers who have been exposed to vapours when diacetyl is heated. So far three workers have died, and many are awaiting lung transplants. It has been known since 1989 that diacetyl vapour is irritating to the throat and lungs and laboratory studies in the 1990s showed that diacetyl vapours were highly toxic to laboratory rats, with effects likened to 'inhaling acid' by scientists. At this stage, no one knows whether consumers exposed to diacetyl fumes in their own homes are at risk. Dr David Michaels, who heads the George Washington University School of Public Health's Project on Scientific Knowledge and Public Policy, says that diacetyl was approved for food use based on studies that examined consumption, not





inhalation. 'There is compelling evidence that breathing diacetyl vapors causes lung disease and there is no evidence of a safe exposure level,' says Michaels, who has asked the Food and Drug Administration to remove diacetyl from the list of safe additives.

## Tasting with your nose

Flavours and smells are irretrievably linked because flavours are recognised mainly through the sense of smell. That is why you may notice that you can't taste food properly when you have a cold. You can test this for yourself by holding your nose while consuming a food with a strong aroma such as chocolate or coffee – you will have trouble identifying the characteristic chocolate or coffee flavour, although you can still distinguish the basic flavour, such as sweet, sour, salty or bitter. Up to ninety per cent of your perception of taste actually comes from your sense of smell, so the flavour of a food

can easily be changed by keeping the same base flavour while altering the aroma, a technique often used in processed foods. There can be hundreds of volatile organic compounds (VOCs) – chemicals that are in a gaseous state at room temperature – involved in a complex aroma. The giant chemical companies that make flavour additives generally also make fragrances for perfumes, personal care and household cleaning products.

## How flavour additives can affect your health

The first step to understanding how flavour and fragrance additives can affect your health is to realise that all foods consist of natural chemicals. For example, an apple contains over 1000 natural flavouring chemicals, some of which are known to cause health problems for some people in big enough doses. Eating is a chemical

## Flavour facts

In his superb bestselling book *Fast Food Nation* author Eric Schlosser says, 'Natural and artificial flavours are now manufactured at the same chemical plants, places that few people would associate with Mother Nature. Calling any of these flavours "natural" requires a flexible attitude toward the English language and a fair amount of irony.'

### Flavours – What the labels don't tell you

The fact is that most processed foods contain flavouring additives that have been made in giant chemical factories. There are more than two thousand approved flavouring chemicals that don't have to be described on food labels because they are considered to be closely guarded trade secrets. When the word 'flavours' appears on an ingredient list, it means those flavours have been made in a laboratory even if this could be described as natural by the definition above. Natural flavours, nature identical flavours and artificial

flavours could contain exactly the same chemicals although consumers can't tell what's in them because of the secrecy surrounding flavour formulas.

If you studied high school chemistry, you may have made artificial banana flavour as part of the curriculum. It's done by combining amyl alcohol and acetic acid in the laboratory using sulphuric acid as a catalyst without a banana in sight. You will probably remember the result – a chemical called amyl acetate, which smells surprisingly like ripe bananas because it's the dominant flavour chemical in bananas. If a solvent is used to extract this chemical from bananas, the resulting amyl acetate is then regarded as a natural flavour, despite being the same chemical as the amyl acetate made without bananas. Other flavour chemicals include ethyl propionate for a fruity flavour, cinnamic aldehyde for cinnamon, diacetyl for butter (see box) and there are several thousand more.



# Child-friendly sweets the whole family will love



St Claire's Organic Mints®, Sweets®, Tarts® and Aromatherapy Pastilles® are a delicious healthy alternative for those with food allergies and other special dietary needs.

Made with certified organic molasses, evaporated cane juice, pure essential oils and/or natural and organic fruit and vegetable based flavour or colour



Certified Organic  
Wheat and Gluten-free  
Dairy and Casein-free  
Corn, soy and Egg-free  
Peanut and tree nut-free  
Fish and Shellfish-free  
Gelatin-free  
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Fat-free, low calorie, low carb, low GI  
No artificial colours, flavours, preservative  
or animal by-products



Available at all good health and organic stores

Contact Glow Organics (02) 9482 1082  
[www.gloworganics.com.au](http://www.gloworganics.com.au)



Certified Organic-Allergen-Free





**“The giant chemical companies that make flavour additives generally also make fragrances for perfumes, personal care and household cleaning products.”**

balancing act. We have to balance the benefits of nutrients such as vitamins and minerals against the side effects of natural pesticides and other chemicals that may contribute to various conditions.

## It's the dose that matters

The problem for the consumer is not how the flavour additive is made, but the size of the dose consumed. Because manufactured flavours such as artificial strawberry are so cheap, it is easy to add a lot more than you would ever eat in one serve of a natural food. While few people are affected by the food chemicals in one strawberry, when consumers – especially children – consume concentrated doses of some of the chemicals listed below, and particularly if they consume them many times every day in different foods, they can be affected in a variety of ways.

## The taste of strawberries

According to Schlosser, a typical artificial strawberry flavour – in foods such as yoghurts – will probably contain such chemicals as amyl acetate, amyl butyrate, amyl valerate, anethol, anisyl formate, benzyl acetate, benzyl isobutyrate, butyric acid, cinnamyl isobutyrate, cinnamyl valerate, cognac essential oil, diacetyl, dipropyl ketone, ethyl acetate, ethyl amyl ketone, ethyl butyrate, ethyl cinnamate,

ethyl haptanoate, ethyl heptylate, ethyl lactate, ethyl methylphenylglycidate, ethyl nitrate, ethyl propionate, ethyl valerate, heliotropin, hydroxyphenyl-2-butanone, alpha-ionone, isobutyl anthranilate, isobutyl butyrate, lemon essential oil, maltol, 4-methylacetophenone, methyl anthranilate, methyl benzoate, methyl cinnamate, methyl heptene carbonate, methyl naphthyl ketone, methyl salicylate, mint essential oil, neroli essential oil, nerolin, neryl isobutyrate, orris butter, phenethyl alcohol, rose, rum ether, gamma-undecalactone, vanillin and solvent. Chemically, there isn't actually much difference between the list of chemicals in a real strawberry or in an artificial strawberry flavour.

### Health

- headaches or migraines
- rashes (hives, eczema, dermatitis, other itchy rashes)
- stomach aches, bloating, reflux, constipation, bedwetting, sneaky poos
- asthma, frequent cough, stuffy or runny nose
- frequent colds, flu, ear infections
- joint pains, swelling of the joints
- heart palpitations, fast heart beat, pseudo heart attack

### Behaviour

- sleep disturbance (difficulty falling asleep, frequent night waking, night terrors, restless legs)
- restlessness (loud voice, irritable, easily distracted, demanding, easily bored)
- irritability (touchy or easily annoyed, loses temper, throws tantrums)
- oppositional defiance (temper outbursts, often says no, refuses requests, defies rules, angry)
- inattention (forgetful, disorganised, foggy brain, dreamy)
- anxiety (lethargic, depressed, panic attacks)
- unhappiness (grizzly, miserable, cries frequently)

Effects induced by additives



## Salicylates

Among the flavours in strawberries you can see a chemical called methyl salicylate. Salicylates – in most fruit, some vegetables, herbs, spices and other plant products – are some of the chemicals most likely to affect sensitive consumers. When the use of manufactured flavour additives became widespread in the 1960s, due to the burgeoning popularity of processed food, Californian allergist Dr Benjamin Feingold discovered that ‘allergy’ symptoms caused by these additives were actually symptoms of salicylate sensitivity. Then chief of the Allergy Department at the Kaiser Foundation Hospitals, Dr Feingold was the first to report adverse health effects of these additives in a medical journal. In his article entitled ‘Recognition of food additives as a cause of symptoms of allergy’, he included the 1610 synthetic flavours and 502 natural flavours listed at that time.

In 1985, a comprehensive analysis of the salicylate contents of foods showed that there were salicylates in even more foods than Dr Feingold realised (see below). In general, the stronger the flavour of a food, the higher the salicylates. Flavourings such as vanilla are eaten in much smaller quantities than whole foods, so the amount of salicylates in vanilla flavour as eaten in a product such as ice-cream is very low, and much safer for some consumers than a strong fruit, mint, spicy or herbal flavour.

## Salicylate contents of foods

Food	mg salicylate per 100gm
Worcestershire sauce	64.3
Mixed herbs, dry	55.6
Cinnamon powder	15.2
Peppermints, range up to	7.6
Tomato sauce, range up to	2.5
Orange	2.4
Vanilla essence	1.4
Strawberries	1.4
Pears, peeled	0.0

Source: A. Swain *et al.*, J Am Diet Assoc, 1985, 85(8): 950-960

## The effects on our kids

Parents are most likely to see the effects of added flavours from children’s syrup medications, which can contain extremely high levels of flavouring. One mother described how her normally additive-free two year old became ‘argumentative, rude, defiant, violent, uncontrollable, and began waking in the night for up to 3 hours’ while taking a course of antibiotic syrup for tonsillitis. Another recalled the effect of a colour-free flavoured pain reliever on her toddler: ‘he became incredibly agitated – head banging, aggressive, thrashing ... inconsolable ... we rushed to the doctor (because we were to hop on an international flight the next day!) and he sent us off for urgent blood and urine tests. While waiting for the tests about 3 hours later my son suddenly regained his composure and became calm.’

## The 30-minute rule

Confusion about the effects of food additives is largely due to the time delay before effects become obvious. Unlike peanut and other true food protein allergies, which can occur within minutes, reactions to food chemicals can occur up to three days later. Salicylate research has shown that consumers are unlikely to identify the cause of their symptoms unless the reaction occurs within 30 minutes.

## Flavour enhancers

Another group of chemicals that occur naturally but can be concentrated or created by processing are the glutamates, often found in tasty foods (see table p134). As with salicylates or any other chemicals, the more you eat, the more likely you are to be affected. A few people are not affected at all, some are only affected when they eat extremely high doses and others are so sensitive that they will be affected even by small amounts. For example, as a concentrate, Monosodium glutamate (MSG) can easily be added to any foods in much greater quantities than in nature. A study of



Nothing artificial?

If you've ever wondered how manufacturers can say 'no artificial colours or flavours' on products such as flavoured noodles, which contain MSG (listed as flavour enhancer 621), the answer is that 'flavours' and 'flavour enhancers' are different classes of additives according to food regulators, flavours being 'intense preparations' added to impart taste and/or odour, whereas a flavour enhancer enhances the existing taste.

59 normal volunteers found all except one reacted to MSG added to home-made chicken soup, with the most sensitive to the smallest amount (3 grams) and most subjects reacting to higher doses. Although the doses of glutamates in natural foods are tiny compared to added MSG, some sensitive consumers are affected by them.

Glutamate contents of foods

		mg glutamate
Food	Portion size	per serve
Chinese soup	1 bowl	5000.00
Tomato juice	1 cup	0.83
Mushrooms	1/4 cup	0.09
Parmesan cheese	2 tbsp	0.05

Sources: H. Schaumberg et al., Science, 1969, 163;826-82  
U.S. Food and Drug Administration

MSG

MSG was the first of the flavour enhancers. It was originally developed from a kombu seaweed extract by a Japanese scientist in the early 1900s and launched in the US in 1948, where it rapidly became a multi-billion dollar business used to intensify the flavour of tasty takeaways, snacks, soups, sauces and meat-based meals. There were early reports in medical journals of Chinese Restaurant Syndrome, a condition occurring within 30 minutes of MSG ingestion and characterised by headache, a burning

feeling, facial pressure and chest pain, sometimes with diarrhoea, and occasionally with sweating and palpitations that could be mistaken for a heart attack. Later, there were reports of MSG-induced asthma. Due to extensive industry promotion of MSG as safe, targeted in particular at health professionals, adverse effects of MSG are now considered controversial in the medical literature although recognised by consumers and allergy clinics worldwide.

Consumers are frequently confused because manufacturers can hide sources of MSG in other ingredients. For instance, all the following ingredients may contain high levels of glutamates, which don't appear as MSG on the label: hydrolysed vegetable protein (HVP), vegetable protein extract (derived from wheat, soy beans or other vegetables), hydrolysed plant protein (HPP), yeast extract, vegetable extract, soy sauce, Worcestershire sauce and soy extract. There are many ways of describing these on a label. If a delicious 'all natural' spread, sauce, stock or seasoning seems to be made largely from soy bean, wheat or vegetable protein of any description, you would have to suspect that it has been broken down with acid in a laboratory to create free glutamates.

The new flavour enhancers

In the 1990s, a new set of flavour-enhancing chemicals called nucleotides were introduced. These additives (disodium guanylate 627, disodium inosinate 631, and ribonucleotides 635, a combination of the previous two) were developed to boost the flavour enhancing effects of MSG by up to 15 times and, like MSG, are made in giant factories where they are synthesised from yeasts and regarded as natural. They can appear in products labelled 'No MSG' although usually there is some natural form of MSG such as yeast extract present. Since the introduction of nucleotide flavour enhancers, the Food Intolerance Network has received more adverse consumer reports about these additives than any other, with some consumers complaining about 'years of hell'. Some people who have

tolerated moderate amounts of MSG all their lives can have dramatic reactions to ribonucleotides, with a variety of symptoms from itchy skin rashes (Ribo Rash), swelling of the lips, tongue or eyes, anxiety, heart palpitations, panic attacks, headaches, heartburn or muscle spasms to sleep disturbance or behavioural disturbance in children. Effects can become apparent any time from within minutes to 48 hours later or several days later and can last for up to a week or more, sometimes coming and going during that time.

The 30-minute rule again applies. Consumers who have a reaction soon after eating are more likely to work out what is affecting them. A woman who avoided MSG because of irritable bowel symptoms wrote: 'I found some corn chips that advertised "No

**"If a delicious 'all natural' spread, sauce, stock or seasoning seems to be made largely from soy bean, wheat or vegetable protein of any description, you would have to suspect that it has been broken down with acid in a laboratory to create free glutamates."**

MSG" and bought them a few times before connecting them with a very uncomfortable feeling of restlessness, agitation and panic, heart palpitations, hot flushes and a "buzzing" sensation; I thought I was having a panic attack. Since recognising the link [with nucleotide flavour enhancers] I bought the chips once more to test the idea that this was the cause; after about five chips I started to feel the "buzzing" and threw the rest of the packet away.'

Because of the delayed onset, some consumers have suffered from distressing symptoms for up to ten years before discovering the cause of their problems. For example, a dose of 635 in soup for Friday lunch can result in symptoms at midnight on Saturday, leaving consumers looking for something to blame in Saturday's dinner. Flavour enhancers are used extensively in takeaways, packet snacks and ready meals,

but also in less obvious food choices such as veggieburgers, fresh or cooked stuffed or seasoned chicken, sausages and marinated meats or manufactured crabsticks in sushi. These additives have even tripped up conscious food consumers in apparently healthy foods such as vegetable stocks and stock cubes.

There are currently over 2000 flavour additives and 400 additives that must be described by name or number on labels. Of the non-flavour additives, about 60 have been linked to health and behavioural effects. People vary in their sensitivity and although colours are often associated with irritability, sulphites with asthma, and ribonucleotides with rash, any additive can be associated with any side effect.

### Flavours

- over 2000 secret manufactured flavour additives that don't have to be identified by name or number

### Flavour enhancers

- glutamates (620–625; MSG is 621)
- nucleotides (627 disodium guanylate, 631 disodium inosinate, 635 ribonucleotides)
- HVP, HPP and other concentrated natural forms of glutamates

### Colours

- artificial colours and natural colour annatto (160b)

### Preservatives

- sorbates (200–203), benzoates (210–213), sulphites (220–228), propionates (280–282), nitrates and nitrites (249–252)

### Synthetic antioxidants

- antioxidants 310–312 (gallates), antioxidants 319–321 (TBHQ, BHA, BHT)



## Who should avoid additives?

When processed food became a growth industry in the 1960s artificial flavours were widely used, but in the last twenty years – due to the consumer perception that natural flavours are healthier – there has been a move towards manufactured natural flavours. As with many other industrial chemicals, most flavour additives have never been properly tested for their effects on humans and fall into the category of GRAS ('generally recognised as safe').

It is possible to avoid added flavours and flavour enhancers by avoiding highly

processed foods. To stick with the doses provided in nature, you can add fresh strawberries to plain yoghurt or choose products with low or no flavours. Organic products will be some of the safest. For example, yoghurts are more likely to contain only real fruit as flavouring or will often specify 'vanilla' as the only flavouring additive. Organic chocolate tastes quite different from highly flavoured supermarket lines. If 'flavour' is listed, you are likely to find it refers to vanilla or essential orange oil. There are some people for whom even that will be too much. Children and adults who are sensitive to the smallest amounts of food chemicals – including those in unprocessed natural foods – will feel better if they avoid the higher salicylate fruit like oranges and stick to lower salicylate fruit such as pears.

If you have ever seen an obvious reaction to any additives or foods, even once, it is worth learning more about food intolerance. Whatever you see is usually just the tip of the iceberg. The effects of natural food chemicals can creep up slowly and leave you wondering why your child isn't doing as well as you expected, or why you rarely feel as healthy as you should. Although children are the most vulnerable, adults can be affected too.

For more information and references, see [www.fedupwithfoodadditives.info/factsheets/Factflavour.htm](http://www.fedupwithfoodadditives.info/factsheets/Factflavour.htm) ■

## Flavour facts

- As we have seen, there is no significant difference between many artificial flavours and their natural counterparts: it is the size of the dose that can cause problems
- Some consumers are more sensitive than others
- Some will not be affected at all
- Some will be affected only by large doses of food chemicals such as salicylates in strawberry-flavoured sweets or medication
- Those who are more sensitive will be affected when, for example, strawberries are concentrated in products such as strawberry yoghurt

## Hilde Hemmes' Organic Vegetable Broth

**When** you choose a broth, it is important that you know exactly what you are getting as some commercially-made broths are loaded with chemicals and synthetic ingredients.

**Hilde Hemmes'** Organic Vegetable Broth is suitable for those who are juice fasting because it makes an excellent wholesome warming drink. It is free from preservatives and toxins, and actually works with your body to revive your system during detoxification programs.

**The** whole family will enjoy its rich flavour as a light soup drink, in stews, vegetable soups, sauces and casseroles, or in place of salt in many recipes.

### Ideal for vegans and vegetarians

Hilde Hemmes' Organic Vegetable Broth is available from all good organic retailers and health food stores.



Herbal Supplies Pty Ltd (08) 8264 2453; [enquiries@herbalsupplies.com.au](mailto:enquiries@herbalsupplies.com.au); [www.herbalsupplies.com.au](http://www.herbalsupplies.com.au)

# Abundant Earth organic hot chocolate

Chocoholics, listen up! For the ultimate guilt-free chocolate indulgence, try Abundant Earth Organic Hot Chocolate. This beautifully presented Hot Chocolate is created in the traditional style of Dutch-process Drinking Chocolate and uses only premium organic cocoa for a sensationally rich and chocolaty taste experience.

It makes a deliciously warming comfort drink on cold days but also a great refreshing iced chocolate on warmer days, just add a dash of hot water to dissolve it before blending with cold milk.

The great news is Abundant Earth Organic Hot Chocolate is 97% Fat Free with no artificial sweeteners, colours, flavours or preservatives. Certified organic, it is made with the finest organic cocoa beans that are grown without chemical pesticides, fertilisers or genetically modified ingredients, so they contain their full, rich flavour, just as nature intended.

**Abundant Earth Organic Hot Chocolate is now available from selected specialty organic and health food stores, Coles, Woolworths & Safeway supermarkets.**



[www.abundantearth.com.au](http://www.abundantearth.com.au)



**Restless Babies** by Sue Dengate *Reprinted with permission from the Summer 2001 newsletter of Nursing Mothers Association (now the Australian Breastfeeding Association).*

See below this for text of [More Restless Babies](#) by Sue Dengate *Reprinted with permission from the February 2008 Australian Breastfeeding Association's magazine Essence.*

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During the first three weeks of her life, baby Emily Ridden slept most of the time. She rarely cried, sometimes having to be woken for feeds and her weight gain was good. Then Emily started to have wakeful times during the night. Feeling tired, her mother Cindy relied on up to five cans of carbonated lemon drinks a day to give her energy. Emily's wakeful periods increased until soon she was sleeping only about eight hours total in a day. 'I kept trying to feed her to sleep but even if I could get her to sleep she would wake as soon as I tried to move her,' recalls her mother.

Cindy's lemon drinks contained an artificial yellow colour called tartrazine (code 102). Six years ago, medical researchers discovered that tartrazine can cause irritability, restlessness, inattention, difficulty settling to sleep and frequent night waking (Rowe KS and Rowe KL 1994). The more you have, the more likely you are to be affected. Young children, and especially babies, are the most vulnerable to the effects of food additives because, dose for weight, they take in greater amounts than adults. Food additives can be transmitted through breastmilk (Clarke L et al 1996). Unknown to Cindy, the soft drinks were making her baby restless and wakeful.

Cindy also noticed that Emily's bowel motions had become dark and frothy, 'like cappuccino'. This can also be an effect of food chemicals. Altogether, 50 additives (see box) and some natural chemicals have been associated with problems including stomach-aches, bloating, diarrhoea, reflux, itchy skin rashes, migraines, headaches, asthma, depression, anxiety, unexplained tiredness, forgetfulness, hyperactivity and recurrent mouth ulcers. No child reacts to food colouring alone, and it was to take Cindy the next 15 months to find out exactly which foods affected her daughter.

In the meantime, Cindy's doctor suggested that sugar might be contributing to Emily's 'cappuccino poos', so Cindy cut out the soft drinks. Emily improved, although she still woke frequently at night and never slept for more than 30 minutes at a time during the day.

Introduction of solids at nearly five months started a new round of problems. For the first time, Cindy heard her baby really scream. Episodes, which lasted for hours, were accompanied by back-arching. Cindy tried the usual foods, introduced one at a time - rice cereal, potato, pumpkin, apple, pear, chicken, lamb and vanilla yoghurt. During this time Emily was restless and woke often with occasional bouts of screaming. The night after her first mouthful of broccoli, Emily slept only ten minutes at a time, tossing and turning, screaming and arching her back all night.

Child health nurses, doctors and paediatricians all agreed that Emily was a healthy baby. Settling techniques learnt at a sleep management course helped but were not enough. If Emily was feeding well she would sleep well. Sometimes she would arch back off the breast and constantly wriggle and fidget while feeding. At these times she would sleep badly. There was no problem with supply or let down. Medication for reflux made Emily worse. Cindy wondered if her baby's behaviour might be caused by stomach aches associated with certain foods.

During the next six desperate months, Cindy gradually identified a number of seemingly unrelated foods eaten either by herself or Emily that could cause problems. But it didn't make sense. As well as medications containing artificial colours or flavours, Emily seemed to be affected by a number of healthy foods eaten either by her or her mother. Tomatoes and broccoli were the

worst. Eventually Cindy found a doctor who could interpret these reactions. Broccoli and tomatoes are very high in a number of food chemicals including salicylates. Cindy Ridden's daughter is one of an estimated ten per cent of the population who react to these natural chemicals.

Salicylates (sal-i-sill-ates) are one of many chemicals that all plants have developed to protect themselves. Most people are able to detoxify many of these poisonous chemicals. However, some common foods contain enough of these chemicals to cause reactions in sensitive people. Intolerance to aspirin, which is a form of salicylate, is well recognised. Yet most people are unaware that significant amounts of salicylates occur naturally in foods such as fruits, fruit juices, vegetables, herbs, spices, nuts, wines, tea and coffee. According to researchers at Sydney's Royal Prince Alfred Hospital, an average Australian diet may contain up to 100 mg of natural salicylate per day (Swain AR et al 1985). This quantity can easily trigger food intolerance symptoms in sensitive people. Salicylate intolerance is usually difficult to identify since salicylates are eaten so frequently.

Reactions to food chemicals are not true allergic reactions, so they cannot be confirmed by allergy testing. The only way to be certain of which food chemicals affect you is to try a strict elimination diet for three weeks, followed by careful reintroduction, or challenges, of certain food chemicals. This is to make sure that healthy foods are not avoided unnecessarily. Cindy was referred to a dietitian who started them both on the Simplified Elimination Diet from Royal Prince Alfred Hospital. When she and Emily began the elimination diet, Emily improved almost immediately.

Three days later, Emily worsened again. By now, Cindy had read my book *Fed Up* and, discouraged, she phoned me from Perth. We had a lot to talk about. Seventeen years ago, I lived through the same experiences with my daughter. The elimination diet was not available then. Food intolerance symptoms can change with age and for years we lived with Rebecca's reactions, starting with colic, restlessness and wakefulness and progressing to oppositional defiance, learning difficulties and eventually a diagnosis of attention deficit disorder. Her younger brother suffered from headaches, stomach aches and skin rashes. When Rebecca was 11, we all tried the elimination diet, and everyone in the family improved in different ways. Rebecca sticks to her diet strictly and is now in her final year of school, happy and successful.

I have talked to thousands of parents who have struggled with the effects of food on their children's health or behaviour. I have experienced myself, and seen in others, that mothers who are using the elimination diet need support. They need information and child-friendly recipes, and need to be able check on little details because even one small mistake a day can ruin the effects of the diet. To help with this, I wrote *Fed Up* as a guide and support manual for parents, and established the Food Intolerance Network of Australia. We now have members from 12 countries. We publish regular newsletters, available free by email. These are displayed on the website with reader feedback and new information. Readers are welcome to ask questions by email and there is an email discussion group. Several food intolerance support groups have been established around Australia. Information about the elimination diet for management of food intolerance in children and adults was only published in the *Australian Journal of Nutrition and Dietetics* in 1996, so it is quite new.

If you suspect food intolerance in your breastfeeding baby, you might like to first try avoiding additives (see list of additives to avoid). Some people find that cutting down is enough. If you still have problems, especially if there are any relatives with food intolerance symptoms like migraine, then you might want to try the elimination diet. It is essential to be supervised by a dietitian. Your dietitian will give you two booklets from the Royal Prince Alfred Hospital. If your dietitian is supportive but inexperienced, she can refer your questions to the RPAH Allergy Unit, a group that acts as a resource for dietitians all over Australia.



Everyone is different and although some children improve within hours of starting the elimination diet, others can take longer. If there is no improvement at all within a week it is worth checking for mistakes with your dietitian. Sometime in the first two weeks, often on days four and five, symptoms worsen. These are withdrawal symptoms. These withdrawal symptoms are a good sign that the diet will work.

Eight weeks later, Cindy reports that Emily is waking only once a night. Emily can tolerate a wide range of additive-free foods including permitted fruit, vegetables, wheat, egg and sugar, but not dairy foods or salicylates. She's more settled and content than ever despite teething and as Cindy says, 'When she's happy, I'm happy'. Cindy's only regret is that she didn't know right at the beginning about food chemicals that could affect her baby.

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Response from an Early Childhood Nurse to this article

### **[129] "I am an early childhood nurse ..." (November 2001)**

Our dear Rosie was born August 2000. She is our second child, so we expected that she would be a tad easier than her brother. Alas, our Rosie had many new tricks in store. For the first 4 months or so she was 'OK', I just called her 'highly strung', and 'a hormonal girl'.

By 5 months she was really quite miserable, irritable, constantly grizzling and wanting to be held (except of course when we went out anywhere, where she played the cute, smiley happy babe).

Sometimes she seemed to be in pain, and we gave panadol with some relief for only a short time. We tried the reflux, colic, etc avenues, with no improvement. My husband was very understanding and supportive, as he lived with unhappiness, and my Mum saw the other side of her, but most of my friends didn't understand our problem, as she really was a 'street angel and home devil'.

Her sleep was poor by day, but strangely, she rested reasonably overnight, some nights only waking once or twice, and generally able to resettle quite well. I think she was so exhausted after her strung out days. For the bad nights she mostly slept in our bed, where we could all get some sleep.

I am an early childhood nurse, and had great support from my two wonderful colleagues, one saw her in a really sad state when visiting us at home. We had tried me off all dairy products at 5½ months, as Rosie was fully breastfed. That seemed to improve things a bit, but I still felt that babies should be happy, unless they had good reason not to be. Finding the reason was the trick. We also tried a naturopath, who felt she could help with a range of herbal remedies, which we started on.

Then I read your article called "Restless Babies", in the Nursing Mothers Magazine. [See "Restless Babies" article on website]. I felt the article was about us!! It was the start of a big change in our lives. We saw our local dietitian who gave us the booklets from RPAH, and discussed it. As I was breastfeeding, and she was on some solids, Rosie and I started the elimination diet when she was 7 long months old.

My very supportive husband was quite sceptical, she was such a beautiful fat healthy looking babe, how could it be diet related?? Anyway after only 3 full days on the diet, he was very apologetic for his scepticism. Our little girl was significantly happier, and so were we.

Each day seemed to get better, she now seemed able to relax her body at times, and was able to play alone for very short periods. I found sticking to the diet quite easy, as the improvement in Rosie was well worth it. Eating was a great source of pleasure for Rosie, so the diet did not worry her at all. The added bonus for me was that those extra 'hard to shed' kgs fell off me. That gave me a needed confidence boost as well.

We had a bad experience early on. Rosie was pretty miserable with a cold, so we gave her some panadol drops and put some Vicks rub on a tissue under the sheet as we put her to bed. An hour later she woke and was 'high'. She tried to get back to sleep, but her body was so restless and I hate to think what her head felt like. I took her to our bed and held her to try to control her body for her. She finally fell off to sleep after about 4 hours.

Rosie is now 14 months old. I weaned her at 10 months, as I began to crave some tasty food. I was too scared to do any challenges, so we were on the very basics.

Rosie continues the elimination diet, and still loves her food. We finally tried some challenges, wheat is OK in very small doses. Salicylates were a disaster, (pumpkin twice a day for 2 days and a granny smith apple core), she became irritable, clingy, whingy etc, then vomited, with no associated illness. We will try them again one day to be sure. We are trying amines at present, just banana to start with, OK so far.

I feel this experience has been wonderful for me professionally, and my colleagues too. I also recently heard that our dietitian who helped me with the diet (who has since moved) has tried the diet to get a feel for what she was prescribing, and has seen changes in her family she was not expecting. I have also had chats and given some of your info to our child psychologist who has quite an interest in ADHD. I will keep pushing the cause, I worry about all these behaviour problems, and see that some could be so easily sorted with food.

So thank you so much Sue, I hate to think where our family would be without your big input. I am converted. My husband is too, but he is a little nervous about how I will go when our children start school and I have some input into the tuckshop! Many, many thanks again from all our family. - Cath, by email

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## **Tartrazine and breastfeeding**

Thank you so much for the "Restless Babies" article. I recommended it to a distraught mum via a breastfeeding support bulletin board. She was shocked to discover that tartrazine was hiding in many 'healthy' foods. Within just 2 days of changing her diet, her baby had a normal sleeping pattern. Not only that, but her 2 year old 'spirited kid' is much calmer, and has stopped throwing incessant tantrums.



Other board members have benefited from the article, including one mum who recognised the frothy 'cappuccino' poops mentioned. She had asked her pediatrician about it, but he had no idea what caused it. Changing her diet to exclude tartrazine cured both the frothy poops and the night waking.

Here are the foods that the mother in the USA was surprised to find tartrazine in: potato bread, yoghurt, canned soup, margarine and cough syrup. She was also eating, and feeding her 2 year old, cakes, cake mixes, donuts, muffins, snack cakes, ice-cream, cookies and crackers, drink mixes, lemonade, pudding mix, boxed meals, rice and pasta dishes, cheesecake, butterscotch candy, jelly and chips all containing tartrazine.

## Dani's diary

**Birth** - Chris is born nearly 2 months early. We stay in hospital until Chris is a month old. Staff regularly comment on the huge amount of crying he does and his restlessness. They put this down to a consequence of being prem and assure me he will be more normal and settled by the time he was due to be born.

**2 mths** - Chris doesn't settle - he gets worse, screaming and crying all the time all day and night. Regularly passes out from lack of oxygen. We try every colic remedy available - nothing helps. I even try giving him a range of formulas on the doctor's advice - none of these make any difference so after a few day on each I go back to breastfeeding.

**2 1/2 mths** - we notice Chris has a serious hernia and needs an emergency operation - his stomach is split right across and the muscles are trapping the arteries going to the testes - we hope no permanent damage is done - staff and doctors tell me it was probably caused as a result of the bad colic he has and him pushing in pain all the time. They assure me he will be a lot better when his stomach heals and should settle down - a bit of a contradiction but I go home and hope.

**3 1/2 mths** - I am totally exhausted and can not cope at all anymore - sick of the lack of support and everybody telling me that babies cry and I should just get over it. They all think I am a hypochondriac. I start colouring behaviour charts showing his screaming/crying/grizzling and sleep. I now know I am not exaggerating or pulling things out of proportion - the charts show he is worse than I thought. He is crying and screaming for about 18 hours out of 24. When he does sleep out of exhaustion it will be for one or two hours only - generally throughout the night. He rarely sleeps during daylight hours.

I ring my doctor in desperation. I am afraid I might hurt Chris if I don't get some sleep soon and get him sorted out. My doctor admits us to hospital. The staff take over Chris and I get to sleep. Staff are amazed at the amount Chris screams - at first they think it is just because he is away from me and home but I assure them he is the same at home. His crying continues non stop even after being in hospital over a week and in my arms a lot of the time. The doctor suggests we try the elimination diet. We see our local dietitian. I start the diet. The dietitian suggests we don't give Chris any solids for a while. I read somewhere that he shouldn't get them until he is about 7 to 8 months old.

**4 1/2 mths** Chris is getting a lot better. He isn't screaming near as much though is still crying a fair bit. We really notice it when I eat anything on the no go list - we have to cope with his screaming within 24 hours.

Chris's diarrhea is nowhere near as constant. He is now sleeping for 4 to 5 hour blocks at night and settling quickly after a feed and change. His body language now shows more tiredness rather than pain symptoms when he is upset. His reflux has disappeared.

**5 1/2 mths** My behaviour charts show that Chris is improving a lot. He is now crying more than screaming. He is slowly getting over all withdrawal symptoms of the many chemicals in the foods that I was eating that were affecting him. I still can't get him to sleep during the day. (The diet is not as effective as it should be because I am making salicylate mistakes like drinking way too much lemonade and eating lots of carrots and pumpkin - but I don't find that out for another 10 months.)

**7 1/2 mths** We start using management strategies to try to get Chris to sleep during the day. Our doctor thinks he can't sleep as he doesn't know how and is not in the habit. We succeed after a week and now Chris is sleeping for 2 hours in the morning and afternoon. We also introduce some solid foods. Chris's crying and grizzling improves hugely. He is now actually appearing to be really happy sometimes.

**12 mths** Chris weans himself and has been on Neocate ever since - other formulas such as soy cause instant unpleasant reactions - back to no sleep and crying a lot.

**14 mths** Chris goes off all carrots and pumpkin - makes it really hard for me to find foods to get him to eat as he eats a huge amount of each of these. We notice a big change in Chris - he stops grizzling altogether and is suddenly really easy to manage. He is a lot more agreeable!! Have a look through my books and discover that pumpkin and carrot are moderate in salicylates - I thought they were low!! No wonder he wasn't 100%. He was obviously getting too many salicylates!

**19 mths** Chris is now fantastic. We are really enjoying him. He reacts to all the things avoided on the elimination diet still so it is not much fun when we try challenges. We really pay for it - he reacts differently with different chemicals. Salicylates, preservatives and amines make him scream in pain and he gets diarrhea. Preservative 282 in bread is by far the worst - within 3 hours Chris is screaming in agony and has chronic diarrhea. When I was breastfeeding and ate 282 he would react within 12 hours. Colours make him really hyperactive, uncontrollable and he ends up getting hurt. - Dani Hewton, WA

## Rita's baby

We were doomed from the start when you look back on it.

I grew up on the Great Lakes in Canada. My father worked at Allied Chemical (located on the water) for 20 odd years. We ate fish that he caught in the Lakes two or three times a week. I remember tumours being common in these fish in the latter days. I do wonder what effect living in this environment and eating the fish has had on the situation I am presently in.

I used to be a hairstylist, but had to give it up due to reactions to colours, perms, allergy to latex gloves and sensitivity to customers' perfumes. I also have hayfever. My husband has asthma and seasonal allergies and his whole family has asthma.

From birth, our daughter never slept more than 40 minutes at a time, day or night, and by the second week she screamed most of the time. Nobody understood why she wouldn't "just fall asleep" in her pram or her crib or the car. She was seen by a quite a few doctors, midwives and early childcare nurses but no one did much except to label it reflux and say it would correct itself. Tresillian (mother and baby program) gave a different answer every time. A breastfeeding counsellor put me on a high salicylate diet (peppermint tea, wine, licorice - for relaxation) and told me to feed her around the clock. Needless to say she was totally out of sorts, crying all the time and inconsolable!



Then an early childcare nurse lent me a copy of *Fed Up* and sent me to a dietitian. I immediately started on the elimination diet. My baby calmed down in the beginning, but it wasn't a cure all. I was to the point of just eating rice, chicken and egg and trying to keep my milk supply up to breastfeed. When my baby started losing weight we went to RPAH and started on Neocate. It took a few weeks to wean her but once she was feeling better she accepted it.

Once she was settled we tried to slowly introduce foods from about 6 or 7 months. Except for a small amount of potato and chicken she reacted terribly to everything. She would wake all through the night screaming, refuse a nap and scream all day, refuse her formula and food in general. She was irritable, had loose bowels several times a day, and would be very aggressive.

I also try to stay away from all chemicals in the house for cleaning. She has had terrible reactions to paint fumes in the early days when I didn't realize how sensitive she was. We were trying to renovate our house, that's on hold for a long while.

I had never heard of this before. Allergies to nuts and things yes, but food intolerance and everything that goes along with it, no.

- Rita Mallet, NSW

## **Daniel's story**

From the minute Daniel was born, he was a very unsettled baby. We went home on day three and I expected he would improve when my milk came in. I work as a midwife, so I had some idea of sleepless nights etc, but nothing had prepared me for a baby who screamed constantly when awake and slept very little. My mum said I had been a very colicky baby and my mother-in-law said my husband David had been an extremely colicky baby - so we presumed Daniel was the same.

After three doses of mastitis, I put Daniel on the bottle at five weeks of age. He was just as unsettled on formula as on breast milk. He continued to have several loose green bowel actions a day. The next day we left for the U.K. - my husband David was transferred over there for what was meant to be five weeks but turned into three months. I think ignorance is bliss, when I look back and see myself taking a screaming six week old baby half way across the world to live in a shoe box hotel room. In the U.K. Daniel continued to be very irritable and unsettled. He posited after every feed and only very occasionally vomited. The only place he was happy was in the bath, so we bathed him four times a day some days to keep him quiet. When I look back on my diary of this time, he began interrupting his feeds at about 8 weeks of age. A normal night out for tea (we had no cooking facilities in our room) would be David that would walk out on the pavement with a screaming Daniel while I ate and then we would swap. I remember feeling physically sick myself some nights, he would scream so much.

We visited a doctor for Daniel's immunisations and I told her of his constant screaming - she told me it was colic and that it would improve by three months of age.

I started him on solids early in case he was hungry (rice cereal and tinned pumpkin) and changed to a formula for hungrier babies. He seemed better for a couple of days but then was just as bad.

When we arrived back in Australia I took Daniel to a local GP, the one I had seen as a child myself. Daniel was screaming and it was 11 am. This doctor gave me a lecture about colic (by this stage Daniel was four months old) and said, "how could there be anything wrong with a child that has such good weight gains?" I tried to explain that it was taking 1-2 hours to feed him a

bottle, but he just gave me a lecture on midwives not making any better mothers. He threw a referral at me for a paediatrician on the way out the door (I think only to cover himself).

I tried making an appointment with the paediatrician, but, being Christmas, there were none available for another month. So we continued to battle on and tried Daniel on a soy formula which seemed to help for a while, but then he just went back to square one. He got worse with this feeds, arching his back. We would bang toys on his bottle to distract him. At this stage most nights he was sleeping though and I think that was the only way we survived. He continued to scream and whinge all day and I'm sure he was exhausted at night and that is why he slept. Despite all this he continued to gain weight and reach all his milestones. I lost weight rapidly and was lighter than before falling pregnant. We contemplated that he was just an attention-seeking baby because when we played on the floor, or took him somewhere different, with different toys, he was okay.

The feeding continued to get worse so two and a half months after seeing the GP, when Daniel was six months old I took him to a paediatrician. He immediately diagnosed reflux and oesophagitis (inflammation and ulceration of the oesophagus) and started Daniel on Ranitidine (Zantac) which reduced the acid in the stomach, to stop the 'heartburn' type pain. I will never forget what a relief it was to get a diagnosis; little did I know that this was only the start.

Daniel's feeds immediately improved on the Zantac but he continued to be very irritable and whiny between feeds. Three weeks later we started him on Prepulsid (Cisapride) which increases the rate of the stomach emptying, but it didn't seem to make a great deal of difference. We tried him on Nutramigen, in case he was cow's milk intolerant. It seems to help for a couple of weeks, but then he just went back to the old irritable Daniel.

I had become suspicious of a few things in his diet. We went camping over Easter and I gave him a Heinz tomato based baby food - it came out the other end looking nearly same as it went in and Daniel was extremely unsettled all weekend. A booklet from a support group for reflux babies mentioned avoiding acidic foods for reflux babies so we presumed that was the reason it was upsetting him. Luckily, for this reason, we didn't give him Kiwi fruit, oranges or fruit juice.

At eight months of age he was still whingeing all day and throwing huge temper tantrums (head banging the dishwasher) so our paediatrician organised a barium swallow. He also started him on Mylanta four times a day. The first week on Mylanta he was wonderful and that week he had the barium swallow, which was normal, much to my disgust. The next week he was worse than ever. I stopped the Prepulsid at 12 months and started Daniel on cow's milk, which made no difference.

At this time I went back to work two days a week and left my mum to cope with Daniel - there was no way a child care centre would have taken him. I think going back to work was the best thing. I would come home after my two days and feel ready to cope with another week of life with Daniel. My mum says she even dreaded him coming for the two days sometimes.

Around this time I tried a naturopath, masseur and chiropractor, but nothing really helped.

By fifteen months of age he was no better. A normal day was leaving him scream to get him to have his afternoon sleep and to settle at night. I would put him in his room several times a day on a bad day and sit for ten minutes and try to calm myself down. Normal daily tasks such as cooking meals and washing were all done while he screamed.

I returned to his paediatrician and he referred us to a gastroenterologist at the Royal Children's Hospital in Melbourne. He told us that he doubted Daniel's behaviour was due to reflux (Daniel smiled at him and played with the toys in his room!) He advised I stop the Zantac and organised for him to have a pH study (monitors acid in the oesophagus over 24 hours) and gastroscopy



(tube to look at the stomach and oesophagus). After stopping the Zantac, David actually seemed a little better and stopped his head banging.

The pH study showed 'mild' episodes of reflux. His gastroscopy showed moderate to severe inflammation and ulceration of his oesophagus and suggested that there may be an allergy involved. They suggested we see the allergy department at the Royal Children's Hospital. They put Daniel on the Neocate diet. He was only allowed Neocate formula, rice, zucchini, apple, pear and potato. The doctor at the allergy department also advised me that these children get into such bad behavioural problems that once they're fed and changed you just have to leave them scream! The diet was a disaster to say the least - to try to get an 18-month-old to drink this formula, that you gag on yourself it's so foul tasting, was impossible. Daniel screamed all week and was so bad by the end of the week I had to take time off work. He was constipated from only drinking small amounts of water.

In desperation we were referred to a surgeon about the possibility of surgical correction. He wasn't convinced - so he sent us for a gastric emptying study, which was very distressing for Daniel - they put a large dome over his face and stomach. This showed he only refluxed once. The surgeon suggested trying Losec (Omeprazol) which stops acid production in the stomach and helps heal the oesophagus. We started Losec - after about a month we noticed a big difference in his behaviour - he was a much happier little boy and he actually sat and played with toys for short periods of time - something he had never done before.

I was suspicious of food colouring and artificial additives at this stage, as some evenings we described Daniel as 'bouncing off the walls' he was so hyperactive. For this reason we only let him drink plain milk and water and filled him full of 'healthy' fruits, vegetables and cheese!

Like everything else the effect of Losec was wearing off. Daniel was starting to complain of his 'tummy burning' and pointing to his oesophagus. He required constant amusement and was generally a very unhappy little boy. I was finding him nearly impossible to live with and constantly comparing myself to the other mums in playgroup and wondering why they all got so much enjoyment out of their children.

When Daniel was around two and a half years old I happened to go to a seminar through work on food intolerance and allergy run by the team at the Royal Prince Alfred Hospital in Sydney. I couldn't believe what I was hearing at the lecture - it was Daniel all over! I immediately sent away for the elimination diet books and got a copy of Friendly Food.

I started off by leaving him on dairy and wheat products. After 1-2 weeks we noticed a difference in his hyperactivity on the diet but he was still having many days of irritability and complaining of his tummy burning. His loose bowel actions were persisting. We stopped dairy products and put him on soy and we started giving him Losec in pear jam instead of yoghurt. He had watery diarrhoea for two weeks after stopping dairy products as a withdrawal effect. Unfortunately what we didn't know was the Losec is not absorbed properly unless given in something acidic like yoghurt. After one month of giving the Losec in pear jam, Daniel's stomach pain was severe.

After being unwell for three days with a high temperature and complaining of shoulder tip pain, Daniel was finally diagnosed at the Royal Children's Hospital with pneumonia from aspirating on his vomit. (I had seen two other doctors who told me children don't know where their pain is and that he had a viral infection.) The pneumonia was in the back of his lung and was pressing on his diaphragm, which was giving him shoulder tip pain. I have never seen Daniel so sick - we thought he was going to die.

Again in desperation we returned to his gastroenterologist who advised another pH study and returning to the surgeon for fundoplication, which kinks the oesophagus to stop food refluxing

back from the stomach. He felt he might have a physical problems as well as an intolerance, which caused hyperactivity. So when he was three, Daniel had fundoplication. We stopped the Losec the night before surgery. The surgery was major - four days in hospital and two days on a morphine infusion. As soon as the morphine stopped Daniel started complaining of his stomach burning but now he pointed to his stomach rather than his oesophagus - the surgery had only moved the pain. We recommenced his Losec on leaving hospital. Daniel's weight had dropped from above to below average, as we struggled to maintain his nutrition on vitamised elimination diet.

I hit rock bottom. I was waking at night in a sweat over what I had put him through. I rang the Royal Prince Alfred Hospital Allergy Clinic in Sydney, beside myself, and they suggested that we bring Daniel up to Sydney. I only wish we had done it prior to the surgery.

At the clinic, his behaviour chart revealed that Daniel was very high for hyperactivity and learning problems and we were told we were dealing with severe food intolerance and ADD. We were advised to try Daniel off pears as he is very salicylate sensitive.

Daniel is now nearly four and in the last month he has been consistently much better. He only tolerates rice, potato, cabbage, beans, chicken, lamb, Nuttalex and restricted amounts of sugar. He is still on Losec which we have increased in the last month to combat his stomach pain. We have found he is no longer reacting as badly to perfumes since stopping pears and maple syrup. Since stopping rice bubbles his aggressive behaviour have ceased. He will actually sit and play with toys now, although his concentration is poor at times. We have tried him on Ritalin but if he's having a bad day food wise, Ritalin only makes him worse.

The last four years all seem to blur into one big nightmare but I realise I was becoming very bitter about the whole thing. I have resolved to look ahead only. Daniel is really a beautiful little boy underneath all the problems he has had. I try to make the most of the good days and not dwell on the bad days – Jenny.

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**More Restless Babies** by Sue Dengate *Reprinted with permission from the February 2008 Australian Breastfeeding Association's magazine Essence.*

Five years ago, when my article *Restless Babies* was published in the Australian Breastfeeding Association's magazine *Essence*, I was surprised by the feedback.

Many mothers had been unaware that food additives can pass through breastmilk to affect babies, and that food additives have been associated with irritability, restlessness and sleep disturbance.

'I recommended your article to a distraught mum via a breastfeeding support bulletin board,' wrote one breastfeeding counsellor. 'She was shocked to discover that tartrazine [artificial colour 102] was hiding in many 'healthy' foods. Within just two days of changing her diet, her baby had a normal sleeping pattern. Not only that, but her two year old 'spirited kid' is much calmer, and has stopped throwing incessant tantrums.'

The consumption of food additives in processed foods became widespread in the 1960s and has increased every year since then. The more additives you eat, the more likely you are to be affected, and the effects may be worse when additives are consumed in combinations.

New mothers are particularly at risk. Cindy from *Restless Babies* knew she had to keep up her fluids while breastfeeding so she drank up to five cans of carbonated lemon flavoured drinks a



day, each containing two additives associated with behavioural problems. Another mother wrote, 'my husband thought he was helping by bringing home takeaways every night'.

### **The 30 minute rule**

How will you know if your baby or child is affected by additives? Research shows that if reactions don't occur within 30 minutes, consumers don't make the connection. Yet reactions to additives generally occur hours or even days later. With breastfeeding, the delay is much longer. It's usually only by avoiding these additives that you can see a difference.

When baby Chris Hewton from Western Australia was born he screamed for about 18 hours a day every day for three months, until he and his mother Dani were hospitalised.

'I am afraid I might hurt Chris if I don't get some sleep,' Dani wrote in her diary. 'The staff take over Chris and I get to sleep. Staff are amazed at the amount Chris screams.' Referred by the hospital doctor to a dietitian, Dani began an elimination diet, and Chris' reflux and diarrhoea started to improve. Due to mistakes, it took nearly 12 months to work out exactly which food chemicals affected him. 'Preservative 282 in bread is by far the worst,' she wrote later. 'Within 3 hours, Chris is screaming in agony and has chronic diarrhoea. When I was breastfeeding and ate 282 he would react within 12 hours. Colours make him really hyperactive'. As well, Chris was affected by some natural chemicals called salicylates.

Like Dani, most mothers have never heard of salicylates, yet doctors have reported since the 1960s and 70s that some children's behaviour can be affected while 'under the influence' of these natural pesticides in some medications, most fruit and some vegetables. Food processing has led to an increase not only in additives but also in our daily intake of salicylates because, for example, there are many more salicylates in a serve of juice that contains the equivalent of ten oranges plus peel than in one orange.

### **Allergy or intolerance?**

Food sensitivity runs in families. Babies can be born with a susceptibility to food allergy, reacting to proteins in foods such as peanuts, milk or eggs, or with an intolerance to food chemicals such as additives and salicylates. A family history of hayfever, eczema and asthma suggests an allergic family. Although rare, food allergy is increasing. Mothers in allergic families are urged to delay introduction of peanuts and other known allergens and to avoid them during late pregnancy and breastfeeding.

'My husband has eczema, but I had no idea this meant we were an allergic family', commented a mother from Coffs Harbour. Alerted to the possibilities of food sensitivity by *Restless Babies*, Ruth discovered through tests at a hospital allergy clinic that her baby's rashes were related to a severe peanut allergy.

Ruth's baby also had sleeping problems. 'We could never get her to sleep,' Ruth said. A family history of sleeping difficulties, migraines, irritable bowel symptoms or ADHD suggests food intolerance. As it turned out, Ruth's daughter had both food allergy and food intolerance. Although laboratory tests can confirm allergy, there are no scientifically proven tests for food intolerance, so like Dani, Ruth was put on an elimination diet to find out what was affecting her daughter.

### **How many children are affected?**

When food additives first became common, studies suggested that only a few children were affected. However, as reactions are related to dose and doses are increasing every year, you would expect more children to be affected and that appears to be happening.

Last year I was invited to take part in an additive-free trial at Palmers Island Primary School in Northern NSW. For two weeks, children were offered additive-free breakfasts and asked to avoid nasty additives. Accompanied by a film crew, I visited the school to teach children, staff and parents to read labels. At that stage I doubted whether asking children to avoid additives would make any difference but within a week everyone saw an improvement. After the trial the students were permitted to eat additive-laden treats and everyone could see for themselves the changes in behaviour. Students who had previously been calm and cooperative became loud, cheeky and argumentative.

'I didn't think I'd see a lot of changes because they eat pretty well anyway' said one mother who was surprised to find her boys played much more cooperatively when she switched from artificially coloured lollies to Werthers toffees, and from BBQ flavoured biscuits to plain crackers.

Altogether, out of the hundreds of additives permitted in our foods, more than 50 (see box) have been linked to a range of problems with sleeping, toilet training, bedwetting, fussy eating, speech delay, behaviour and many other seemingly trivial childrearing issues that can erode family quality of life. As well, there can be reflux, colic, nappy rash and other itchy skin rashes, asthma and headaches.

All children are affected differently and any food additive can be related to any symptom. Adults can be affected as well, so mothers often discover a food sensitivity themselves.

### **A '50s diet**

What children ate in the 1950s was low in additives – porridge, preservative free bread, pure butter, fresh fruit and vegetables, home cooked 'meat and three veg', plain biscuits such as butter shortbread, water or milk to drink. There's an additive free recipe booklet on our website with this kind of food and many families can see an improvement by cutting down on additives.

'Since getting your DVD and booklet, we have been amazed at the level of additives and preservatives in nearly everything we fed to the kids', wrote one father. 'After we started to remove the nasties from our 4 year old son's we saw an immediate difference in his behaviour.'

A smaller number of families are sensitive to salicylates. For best results with the most sensitive babies, mothers can do a trial of an elimination diet supervised by a dietitian, although it is important to check with your doctor first in case there is medical cause of your baby's problems. Ruth's baby was five months old when she started on her elimination diet. 'Within a couple of days there was a total change', said Ruth. 'It was quite miraculous. Her eczema cleared up, she was settled and she was sleeping well'.

### **More information**

Food allergy: [www.allergyfacts.org.au](http://www.allergyfacts.org.au)

Food intolerance: [www.fedup.com.au](http://www.fedup.com.au).

A list of supportive dietitians is available from [confoodnet@ozemail.com.au](mailto:confoodnet@ozemail.com.au).

Sue's new DVD, *Fed Up with Children's Behaviour*, is available through [www.fedup.com.au](http://www.fedup.com.au), from selected outlets and online. The Failsafe recipe booklet is freely downloadable from the Fed Up website.

### **About the author**

Sue Dengate is a psychology graduate and former high school teacher who became interested in the effects of foods on children's behaviour as a result of her own children's experiences. She is author of the Fed Up series of books and runs the Food Intolerance Network with her husband Dr Howard Dengate, a food scientist.



## NASTY ADDITIVES

### ARTIFICIAL COLOURS

102 tartrazine, 104 quinoline yellow, 107 yellow 2G, 110 sunset yellow, 122 azorubine, 123 amaranth, 124 ponceau red, 127 erythrosine, 128 red 2G, 129 allura red, 132 indigotine, 133 brilliant blue, 142 green S, 151 brilliant black, 155 chocolate brown

### NATURAL COLOUR

160b                      annatto

### PRESERVATIVES - *sulphite preservatives are most associated with asthma*

200-203                      sorbates (*in margarine, dips, cakes, fruit products*)  
210-213                      benzoates (*in juices, soft drinks, cordials, syrups*)  
220-228                      sulphites (*in dried fruit, fruit drinks, sausages, and others*)  
280-283                      propionates (*in bread, crumpets, bakery products*)  
249-252                      nitrates, nitrites (*in processed meats like ham*)

### ANTIOXIDANTS - *synthetic antioxidants in vegetable oils and margarines*

310-312                      Gallates  
319-320                      TBHQ, BHA, BHT

### FLAVOUR ENHANCERS

621                      MSG (*in tasty foods, fast foods, snack foods*)  
627, 631, 635                      disodium inosinate, disodium guanylate, ribonucleotides  
                                         (*can be associated with itchy skin rashes*)  
HVP                      hydrolysed vegetable protein, vegetable protein, yeast extract

### ADDED FLAVOURS

There are thousands of artificial flavours which don't have to be identified by number because they are considered to be trade secrets. Flavours may contain unlisted artificial colours and preservatives.

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**BACK TO HOMEPAGE**



## PRESENTATION TO "YOUTH AT RISK" CONFERENCE

Hosted by Project Saul and the Australian Federal Police, Canberra, July 2000

### Food and behaviour

by Sue Dengate

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There have been documented changes in children's behaviour during the last half century. The top seven problems in schools, as reported in U.S. national teacher surveys, are shown below:

1940 1990

talking out of turn drug use

chewing gum alcohol abuse

making noise pregnancy

running in the hall suicide

cutting in line rape

dress code infractions robbery

littering assault

### Increase in ADHD

A sharp increase in children's behaviour problems in the 1960s and 70s was noted by two U.S. paediatricians who reported their findings in medical journals. Dr W. Crook described why he became interested in this problem:

"In my general paediatric practice in Jackson Tennessee (pop 50, 000) in the 1950s, my partners and I were "the only game in town". Yet we only saw an occasional hyperactive kid ... In the 1970s, I saw so many hyperactive children that I kept records ... "

Both Dr Crook and Californian paediatric allergist Dr Ben Feingold were convinced that the increase in processed foods was involved in the changes (1). After a number of studies, many funded by the food industry, this idea was discounted and the general consensus was that hyperactivity had always existed and was now recognised more frequently.

However, a new survey in the U.S. shows a real increase in the prevalence of hyperactivity, now called attention deficit hyperactivity disorder (ADHD). The percentage of doctor visits identifying ADHD children has increased from 1.4% in 1979 to 9.2% in 1996 (2). Australian prescribing rates of drugs typically used to treat ADHD suggest a similar increase: from 23,340 in 1990 to 346, 000 in 1998. In the U.S. prescription rates of drugs such as Ritalin and Prozac have increased even for very young children. In 1994, there were 3000 prescriptions for Prozac for babies under the age of 12 months (3).

### Why the increase?

Traditionally, children's behaviour problems were blamed on poor parenting and studies show that mothers of ADHD children do have poorer parenting techniques. However, when the children's behaviour improves with treatment, so do the mothers' parenting skills, suggesting that bad behaviour causes bad parenting rather than the reverse (4). There is evidence to suggest that both food additives and environmental

chemicals may be sources of childhood behaviour disorders (5,6,7,8,9).

Food additives have been used in increasing quantities in our food supply since the 1960s. Irritability, restlessness, inattention and sleep disturbance rather than hyperactivity were the main effects of food additives found by researchers in a Melbourne study (10). Children aged 2 to 6 exhibited constant crying, tantrums, irritability, restlessness and severe sleep disturbance when affected by food colouring. They were described by their parents as disruptive, distracted and excited, high as a kite and out of control. Their parents were exhausted through lack of sleep and the constant demands of their children, who were unable to be comforted or controlled. Children aged 7-14 were irritable, aimlessly active, lacking self-control, whiney and unhappy, "like a bear with a sore head".

## **Oppositional defiance**

Given that irritability is the main behavioural effect of food additives, it is interesting to look at a relatively new condition called Oppositional Defiant Disorder (11) of which irritability is the core feature. Children with ODD like to say no even when it is counter to their best interests. Other features include

losing temper

arguing with adults

refusing adult requests or defying rules

deliberately annoying other people

blaming others for his or her own mistakes

touchy or easily annoyed

angry and resentful

ODD can progress to Conduct Disorder which is essentially a failure to respect the rights of others, from vandalism to robbery to assault, and generally results in breaking the law.

Medications for ADHD do not work with ODD. The approach recommended by psychiatrists is to stay calm, to avoid conflict and confrontation, to avoid backing these children into a corner and to emphasise positivity and reward, but it is acknowledged that this approach has limited success (12).

Symptoms of ODD respond well to dietary management and this is demonstrated in a BBC video, which shows remarkable improvements in a group of young offenders filmed before and after a trial of diet (13). Superintendent Peter Bennett of the West Yorkshire police organised a study with nine children aged 7-16 with persistent anti-social, disruptive and/or criminal behaviours. They were chronic offenders, with an average arrest rate of more than once a month. All were hyperactive. Their offences included violence, criminal damage, theft, arson, and solvent/alcohol abuse. The children remained at home in the care of their parents while following a restricted diet. The health and behaviour of all nine children improved. After two years, two of the subjects had abandoned the diet, re-offended and been placed in care. Two had reoffended at much reduced frequency and violence. Five of the nine subjects had not re-offended. Researchers concluded, "the [dietary] approach appears to work within an ethical, efficient, effective, economical and preventative paradigm without harm" (14).

## **Diet, health and behaviour**

Pursuing the link between diet, health and criminal behaviour, Superintendent Peter Bennett compared two samples of 100 chronic offenders and 100 non-offenders. Of the chronic offenders, 75% had health problems often associated with food intolerance, which is much higher than the rate for non-offenders (15).

Symptoms of food intolerance (16) include:



eczema, itchy skin rashes

asthma, stuffy or runny nose, frequent ear infections

stomach ache, irritable bowel symptoms, reflux, colic, 'sneaky poos'

headaches, migraine, lethargy, impairment of memory and concentration, anxiety, panic attacks, depression, restless legs, sleep disturbance, irritability, restlessness, hyperactivity.

### **How many are affected?**

In 1974, Californian paediatrician Dr Ben Feingold proposed that children's behaviour and learning ability is affected by food additives and natural food chemicals called salicylates (1). Studies in the seventies examining the Feingold hypothesis concluded that only about 5 per cent of hyperactive children were affected. Later studies suggest that Dr Feingold's diet failed to remove sufficient harmful food chemicals. Since the 1980s, a number of studies which have eliminated more foods have achieved success with between 50 to 100 per cent of ADHD children (14, 17, 18, 19, 20, 21). A study in 1993 measured immunological responses in more than 1000 ADHD children and found less than 5 per cent affected (22) but reactions to food additives are not true immunologically mediated allergic responses so this study has no relevance to the incidence of food intolerance. Food additive reactions are difficult to identify because they are related to dose, cumulative and often occur the next day or later. The only way to detect reactions to food additives is through an elimination diet followed by systematic reintroduction.

In Australia the Simplified Elimination Diet from Royal Prince Alfred Hospital (RPAH) is widely used. In a trial of the RPAH diet with 140 hyperactive children, one third improved substantially, one third improved significantly and, of the other third, some improved but their parents reported that the diet was 'not worth the effort' (19,23).

### **Which foods?**

Originally developed for symptoms of food intolerance such as urticaria and migraine, this diet avoids 50 additives (see below) as well as naturally occurring salicylates (eg. in tomatoes and citrus), amines (eg. in cheese and chocolate) and glutamates (eg. in Vegemite and soy sauce). Dairy foods and wheat are also avoided in the most severe cases.

### **Food additives to be avoided**

#### **Colours**

102, 107, 110, 122, 123, 124, 127, 128, 129, 133, 142, 151, 155

160(b) annatto natural colour

#### **Preservatives**

200-203 Sorbic acids

210-213 Benzoic acids

220-228 Sulphites

249-252 Nitrates & nitrites

280-283 Propionic acids

310-321 Antioxidants

#### **Flavour enhancers**

620-635, HVP

## **Artificial flavours** unregulated

### **Salicylates**

These little chemicals are difficult to understand because they occur in 'healthy' foods like fruit, vegetables, herbs, spices, nuts and seeds. All plants produce toxic chemicals to protect themselves, and some humans can be affected by these chemicals. The most common of these chemicals are salicylates, of which aspirin is the best-known. The side effects of aspirin have been recognised for nearly a century, but it is less understood that salicylates in our foods can amount to nearly an aspirin tablet a day. This is more than enough to affect the most food-sensitive people (24). The majority of people who are sensitive to salicylates are unaware of their sensitivity because they eat salicylates many times a day every day and usually react also to some food additives (23).

### **Sugar not the problem**

Although sugar is often blamed for children's behaviour, extensive research has failed to find any connection. A possible reason for improvements observed on sugar free diets is the simultaneous removal of processed food including many additives and concentrated natural chemicals in foods like jam and chocolate. One large and expensive study in the USA found no difference in children's behaviour and learning on disguised diets sweetened with sugar, aspartame or saccharin. However, the children generally improved on all the experimental diets, which were additive free (25).

### **Diet modification in the community**

The prevailing opinion of the medical profession and the food industry is that so few children are affected by food additives that removing additives from children's diets isn't worth the effort. Yet, where dietary modifications have been carried out in the community, the results speak for themselves.

### **School tuckshop in the UK**

In 1996, additive-containing snack foods were banned at school tuckshop of Wolney Junior School in South London and fruit was introduced instead. All the teachers noticed a difference in behaviour and concentration. Within two years, the success rate for 11 year olds in stage two English almost tripled, from 23% of pupils achieving expected results in 1996 to 64% in 1998. The school was listed as one of the most improved in the country (26).

### **School lunches in the USA**

The introduction of a low additive, low sugar policy in breakfasts and lunches supplied by 803 New York City schools over 4 years was followed by a nearly 16% increase in mean academic ranking compared to the rest of the nation's schools, who used the same standardised tests. There was a significant decline in learning disabled children, from 12% to 5%. The percentage of students who ate school breakfasts and lunches in each school was positively correlated with the school's rate of gain (27).

### **Detention Centres in the USA**

Similarly, a series of diet studies in U.S. juvenile correction facilities involving more than 8000 juveniles showed that improvements in approximately 20% of the youths were responsible for a 47% institution-wide decline in antisocial behaviour. As in Superintendent Bennett's study, researcher Dr Stephen Schoenthaler noted that improvements continued for months. He concluded, "this diet policy, for unknown reasons, played a major role in reducing the antisocial behaviour ... the improvements resulted in a long-term reduction in institution-wide behaviour problems at no cost and apparent risk to anyone. Dietary intervention is clearly a cost-effective approach to reducing institutionalised behaviour problems" (28).

### **Conclusion**



Increasing evidence from both small carefully controlled scientific studies and open trials in the community suggests that there are significant benefits in behaviour, health and learning to be gained from dietary modification. The following recommendations can be cheap, workable and beneficial:

- 1) A trial of the RPAH diet should be offered routinely for young children with behaviour problems**
- 2) Schools and other institutions which care for children should promote an additive-free policy.**

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