

# Selected Relevant Research

*By date order, newest studies first*

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## Feingold-type diets used in studies:

- Feingold Stage One Diet – Eliminates synthetic colors, flavors, BHA, BHT, TBHQ and some salicylates in food and, where appropriate, in the immediate environment. This should have been the elimination regimen studied, but was rarely actually used by the researchers.
- Feingold Stage Two Diet – Eliminates synthetic colors/flavors/preservatives but does **not** eliminate salicylates
- Oligoantigenic Diet – A “few foods” diet – far more restrictive than the Feingold diet although also avoiding additives
- Approximation of Diet – A diet assumed to be similar to one of the above, but avoiding a different list of salicylates, not avoiding preservatives, or avoiding additives in food but not in medicine, toiletries, or the environment.

## Challenges used in double-blind studies:

- Usually colorings alone were used as challenges - often only a small amount of a single color.
- Quantities of colorings used were far below the 1977 National Academy of Sciences report on the amounts of FD&C coloring (up to 327.6 mg per day) that the average person ate in 1977. Today, with blue oatmeal and green ketchup, the average is no doubt considerably higher.

## Increasing use of the colorings

- We are concerned about the increasing use of synthetic colorings without adequate testing.
  - Heinz informed us that to make green ketchup, they added yellow & blue coloring sufficient to overcome the red tomatoes, without bleaching the tomatoes, but they declined to reveal the amount of coloring used.
  - One of our members thereupon made green ketchup in a college project, and it took 150 mg coloring PER TABLESPOON!!
  - It takes 1 Tb to cover a hamburger, and at least another Tb for the French fries. Thus, not counting the coloring in the soda or dessert, a person can easily get 300 mg of the coloring at lunch. To our knowledge, NO NEURO-TOXICITY STUDIES HAVE EVER BEEN DONE to show that these colorings are safe for humans at this level.
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**The comet assay with 8 mouse organs: results with 39 currently used food additives**, Sasaki Y et al, *Mutat Res* 2002 Aug 26;519(1-2):103

We determined the genotoxicity of 39 chemicals currently in use as food additives. ... All seven dyes **induced DNA damage** in the gastrointestinal organs at a low dose ... Two antioxidants (butylated hydroxyanisole (**BHA**) and butylated hydroxytoluene (**BHT**)), three fungicides ... and four sweeteners ... also induced DNA damage in gastrointestinal organs.



**Controlled trial of cumulative behavioural effects of a common bread preservative**, Dengate S, Ruben A, *J Paediatr Child Health* 2002 Aug;38(4):373-6

... Twenty-seven children, whose behaviour improved significantly on the Royal Prince Alfred Hospital diet, which excludes food additives, natural salicylates, amines and glutamates, were challenged with calcium propionate (preservative code 282) or placebo through daily bread in a double-blind placebo-controlled crossover trial. ... Irritability, restlessness, inattention and sleep disturbance in some children may be caused by a preservative in healthy foods consumed daily. ...

**Attention Deficit and Infantile Hyperactivity**, Berdonces JL, *Revista de Enfermeria* 2001 Jan; 24 (1): 11-4

"... psychiatric medication has major risks in children. From complementary medicine we can find several aids in changing diet patterns and supplementing with vitamins or minerals. Chocolate, sugar, sweeteners, **additives, preservatives, dyes**, can enhance the incidence of this syndrome. ..."



**DNA damage induced by red food dyes orally administered to pregnant and male mice**, Tsuda S et al, *Toxicol Sci* 2001 May;61(1):92-9

We determined the genotoxicity of synthetic red tar dyes currently used as **food color additives** in many countries.... The 3 dyes induced DNA damage in the colon starting at 10 mg/kg. ... Because the 3 azo additives we examined **induced colon DNA damage at a very low dose**, more extensive assessment of azo additives is warranted.

**The effects of a double blind placebo controlled artificial food colourings and benzoate preservatives challenge on hyperactivity in a general population sample of pre-school children,** Bateman B et al, International Society for Research into Child and Adolescent Psychopathology, June 2001

There is a general adverse effect of artificial food colouring and benzoate preservatives on three-year-old children that is detectable in their behaviour outside the clinic.



**Adverse reactions to foods,** Ring J, Brockow K, Behrendt H, *J Chromatogr B Biomed Sci Appl* 2001 May 25;756(1-2):3-10

Allergic reactions to foods represent a prominent, actual and increasing problem in clinical medicine. .... Elicitors of pseudo-allergic reactions with similar clinical symptomatology comprise low-molecular-mass chemicals (preservatives, colorings, flavor substances etc.). ... In some patients classic allergic contact eczema can be elicited systemically after oral intake of low-molecular-mass contact allergens such as nickel sulfate or **flavorings such as vanillin** in foods.



**Increased leukotriene production by food additives in patients with atopic dermatitis and proven food intolerance,** Worm M, Vieth W, Ehlers I, Sterry W, Zuberbier T, *Clin Exp Allergy* 2001 Feb;31(2):265-73

... Increased sLT (sulfidoleukotriene ) production by peripheral leucocytes in the presence of single food additives was observed in the majority of patients ... These food additives were particularly **tartrazine, benzoate and nitrite**. ..



**Attention Deficit/Hyperactivity Disorder (ADHD) in Children: Rationale for its Integrative Management,** Kidd PM, *Alternative Medicine Review* 2000 Oct; 5 (5): 402-28

*This is a review of treatments.* " . . . major etiologic contributors also include adverse responses to **food additives**, intolerances to foods, sensitivities to **environmental chemicals**, molds, and fungi, and exposures to neurodevelopmental toxins such as heavy metals and organohalide pollutants. Thyroid hypofunction may be a common denominator linking toxic insults with ADHD symptomatology. . . . When individually managed with supplementation, **dietary modification**, detoxification, correction of intestinal dysbiosis, ... the ADHD subject can lead a normal and productive life."

**Synergistic effects of food colors on the toxicity of 3-amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1) in primary cultured rat hepatocytes,** Ashida H, Hashimoto T, Tsuji S, Kanazawa K, Danno G, *J Nutr Sci Vitaminol* (Tokyo) 2000 Jun;46(3):130-6

... the in vitro treated food-color mixture itself showed cytotoxicity: the reduction of cell viability and decreases in the activities of gluconeogenesis and ureogenesis. The food-color mixture enhanced cytotoxicity of Trp-P-1 obviously. ... These results suggest that the daily intake of **artificial food colors may impair hepatic functions** such as gluconeogenesis and ureogenesis...



**Attention Deficit Hyperactivity Disorder,** Anthony HM, Maberly DJ, Birtwistle S, *Archives of Disease in Childhood* 1999;81:189 (August)

"... **an elimination diet is effective in most cases.** . . . If they have had help with finding alternative foods, most parents find it surprisingly easy to keep the child to the diet most of the time after the first few weeks because the child usually prefers to feel well. ... If the diet is effective, behaviour often reverts to normal, to the great relief of all concerned. In view of the potential toxicity of medication in children and its limited effectiveness, all families with hyperactive children should be offered help in detecting offending foods. It is more appropriate to **reserve medication for those who fail.**



**Treatment Alternatives for Attention-Deficit/Hyperactivity Disorder (ADHD),** Arnold LE, *Journal of Attention Disorders*, Vol. 3 No. 1 (April 1999), 30-48

"Twenty-three alternate treatments were identified ... The oligoantigenic or few-foods diet has **convincing double-blind evidence of efficacy** in multiple trials for a properly selected subgroup.  
--- This report was prepared for the November, 1998 NIH Consensus Development Conference on ADHD.



**Alternative and Controversial Treatments for Attention-Deficit/Hyperactivity Disorder,** Baumgaertel A, *Pediatr Clin North Am* 1999 Oct;46(5):977-92

Vanderbilt University School of Medicine". . . Scientific evidence suggests that **individualized dietary management** may be effective in some children. Trace element supplementation also may be beneficial when specific deficiencies are present..."

**Food Intolerance and Food Allergy,** Schnyder, B et al, *Schweiz Med Wochenschr*, 1999 Jun 19; 129(24): 928-33

"Confirmed adverse reactions to foods may be caused by toxic, enzymatic, pharmacological, "pseudoallergic" or allergic mechanisms . . . The diagnosis of these reactions can usually be based on the history and course under a **corresponding diet.**

**Immunological Aspects of the Common Food Colorants, Amaranth and Tartrazine**, Koutsogeorgopoulou L et al., *Vet Hum Toxicol*, 1998 Feb; 40(1); pp.1-4.

“...The results showed clear **immunosuppressive effects** from the 2 substances tested, (*amaranth and Tartrazine, also known as Red #2 and Yellow #5*)...”



**Food and Food Additives Hypersensitivity in Adult Asthmatics. III. Adverse Reaction to Sulfites in Adult Asthmatics**. Arai Y et al, *Arerugi* 1998 Nov; 47 (11); pp.1163-7

“...Twenty adult asthmatic patients ... without a suggestive history of sulfite sensitivity, underwent challenge with oral solution of **metabisulfite** ... 12 patients reacted to metabisulfite. They demonstrated **airway obstruction ... urticaria ... skin manifestation ... and nasal congestion...**”



**Difficult Asthma**, Barnes PJ & Woolcock AJ, *Eur Respir J*, 1998 Nov; 12(5); pp.1209-18

“...approximately 5% of patients are not controlled even on high doses of inhaled corticosteroids ... There may be unidentified exacerbating factors, including unrecognized allergens, occupational sensitizers, **dietary additives**, drugs ...”



**Review: The Role of Diet and Behaviour in Childhood**, Breakey J, *J Paediatr Child Health*, 1997, Jun; 33(3) pp.190-194

“The research has shown that **diet definitely affects some children**. ... and some non-food items are relevant. Symptoms which may change include those seen in attention deficit disorder (ADD) and attention deficit hyperactivity disorder (ADHD), sleep problems and physical symptoms, with later research emphasizing particularly changes in mood.”



**Topographic Mapping of Brain Electrical Activity in Children with Food-induced Attention Deficit Hyperkinetic Disorder**, Uhlig T, Merckenschlager R, Brandmaier R, Egger J, *Eur J Pediatr* 1997; 156; 557-561.

“... During consumption of provoking foods there was a significant increase in beta-I activity in the frontotemporal areas of the brain. This investigation is the first one to show an association between **brain electrical activity and intake of provoking foods ...**”

**Assessment of Chemical Factors in Relation to Child Hyperactivity**, Ward NI, *J of Nutritional & Environmental Medicine (Abingdon)*; 7 (4). 1997. p. 333-42

“..Only hyperactive children showed a significant **reduction in blood serum zinc levels** and an increase in urinary zinc output following consumption of E102 (*Tartrazine*) and E110 (*Sunset Yellow*) ... For the 23 children who consumed a tartrazine beverage there were increased levels of **overactivity (n=18) aggressive (n=16) and/or violent (n=4) activity, poor speech (n=2) poor coordination (n=12)** and the development of **asthma and/or eczema (n=8)**. Most of these were severe or moderate changes...”



**Effects of Prenatal Ethanol Exposure and Early Experience on Home-Cage and Open-Field Activity in Mice**, Mothes HK, Opitz B, Werner R, Clausing P, *Neurotoxicol Teratol* 1996 Jan-Feb;18(1):59-65

“... Mice prenatally exposed to ethanol showed **increased activity** in their home cages...”

For mice and rats, exposure to toxins typically results in hyperactivity.



**Does Oligoantigenic Diet Influence Hyperactive/Conduct-Disordered Children -- A Controlled Trial.**, Schmidt MH et al., *Eur Child Adolesc Psychiatry*, 1997 Jun;6(2):88-95.

“... **dietary treatment cannot be neglected** as a possible access to treating hyperactive/disruptive children ...”



**Phenotypic Variation in Xenobiotic Metabolism and Adverse Environmental Response: Focus on Sulfur-Dependent Detoxification Pathways**, McFadden SA, *Toxicology*, July 1996, Vol. 111(1-3), pp. 43-65.

“...a significant number of individuals with environmental intolerance or chronic disease have **impaired sulfation** of phenolic xenobiotics.... In addition, impaired sulfation may be relevant to intolerance of phenol, tyramine, and phenylic food constituents, and it may be a **factor in the success of the Feingold diet.**”

See more studies relating to PST at pg. 13.

**Prevalence of Chronic Urticaria Following the Ingestion of Food Additives in a Third Tier Hospital,** Jimenez-Aranda GS et al., *Rev Allerg Mex*, 1996 Nov-Dec; 43(6); p.152-6.

"We studied 40 patients with the clinical diagnostic of chronic urticaria .... [Tartrazine] was the additive that cause more reactivity. It is possible to find reactivity to one or more **additives** in a patient with **chronic urticaria.**"



**Food Allergy and Infantile Autism,** Lucarelli S et al, *Panminerva Med* 1995 Sep; 37(3); p.137-41

"...We noticed a marked **improvement** in the **behavioural** symptoms of patients after a period of 8 weeks on an **elimination diet** ...Our results lead us to hypothesize a relationship between food allergy and infantile autism as has already been suggested for other disturbances of the central nervous system."



**Foods and Additives are Common Causes of the Attention Deficit Hyperactive Disorder in Children,** Boris M, Mandel F, *Annals of Allergy*, May 1994, Vol. 72, pp. 462-8.

**73%** of the children responded favorably,  $p < .001$ . "This study demonstrated a beneficial effect of eliminating reactive foods and artificial colors in children with ADHD. **Dietary factors** may play a significant role in the etiology of the **majority of children with ADHD.**"



**Synthetic Food Coloring and Behavior: A Dose Response Effect in a Double-Blind, Placebo-Controlled, Repeated-Measures Study,** Rowe KS, Rowe KJ, *Journal of Pediatrics*, November 1994, Vol. 135, pp.691-8.

**75%** of 200 children improved on a "Stage Two" Feingold-type diet. **63%** of them responded to a challenge of Tartrazine, and **82.5%** reacted to it in a double-blind test. "**Significant** reactions were observed at all six dose levels. A **dose response effect** was observed."



**Role of Food Allergy in Serous Otitis Media,** Nsouli TM, Nsouli SM, Linde RE, O'Mara F, Scanlon RT, Bellanti JA, *Annals of Allergy* 1994 Sep;73(3):215-9.

"... **diet** led to a significant amelioration of serous otitis media (*earache*) in 70 of 81 (**86%**) patients ... The challenge diet with the suspected offending food(s) provoked a recurrence of serous otitis media in 66 of 70 patients (**94%**)." . . . "The possibility of **food allergy should be considered** in all pediatric patients with recurrent serous **otitis media** ..."

**Effects of a Few Foods Diet in Attention Deficit Disorder,** Carter CM et al, *Arch Dis Child*, November 1993, Vol. 69 (5), pp.564-8.

**59 of 78 children (75.6%) referred for "hyperactive behavior" improved on an open trial of an elimination diet.** This was verified in a placebo-controlled double-blind challenge protocol.



**Common Food Additives are Potent Inhibitors of Human Liver 17 Alpha-Ethinyloestradiol and Dopamine Sulphotransferases,** Bamforth KJ et al, *Biochem Pharmacol* 1993 Nov 17; 46(10); pp.1713-20.

"...**dopamine sulphotransferase (ST)** activity was **inhibited strongly** by .... Tartrazine (*Yellow #5*) and vanillin ... Vanillin was found to **inhibit 50%** of liver EE2 ST activity ..."

The Feingold Program avoids these chemicals.



**Effect of Diet Treatment on Enuresis (bed wetting) in Children with Migraine or Hyperkinetic Behavior,** Egger et al, *Clinical Pediatrics (Phila)* 1992 May 31(5): 302-7.

**76%** of 21 children whose migraine or hyperactive behavior had improved also **stopped bed wetting.** "...Enuresis in food-induced migraine and/or behavior disorder seems to respond, in some patients, to avoidance of provoking foods."



**Controlled Trial of Hyposensitisation in Children with Food-Induced Hyperkinetic Syndrome,** Egger J, Stolla A, McEwen L, *The Lancet*, May 9, 1992, Vol. 339, pp. 1150.

"...EPD (*Enzyme-potentiated desensitization*) permits children with food-induced hyperkinetic syndrome to eat foods that had previously been identified as responsible for their symptoms. ... **food allergy is a possible mechanism of the hyperkinetic syndrome.**"

EPD, used in England for 30 years, is no longer available in the United States. See [www.treatmentchoice.com](http://www.treatmentchoice.com)



**Applied Nutrition and Behavior,** Schoenthaler S, Moody J, Pankow L, *J of Applied Nutrition*, Nov. 1, 1991, Vol. 43

*The implementation of "nutrient dense diets" in 813 state facilities (jails) resulted in "significantly improved conduct, intelligence, and/or academic performance..."*

**Children With Atopic Eczema: Clinical Response to Food Elimination and Subsequent Double-Blind Food Challenge**, Sloper KS, Wadsworth J, Brostoff J, *Quarterly J of Medicine*, 1991 Aug; 80(292):677-93

*Eczema improved in 49 of 66 (74%).* "The longer a food had been avoided, the less likely was the chance of a positive food reaction. Clinical history did not predict response to dietary manipulation. A standard elimination diet avoiding cows' milk, egg, tomatoes and possibly colours and preservatives should help up to **three-quarters of patients** ... This diet may be **considered in all children** with moderate or severe eczema."

**The Influence of the Chemical Additive Tartrazine on the Zinc Status of Hyperactive Children: A Double-Blind Placebo-Controlled Study**, Ward NI et al., *J Nutr. Med*, 1(1), 1990. pp.51-58.

"...Tartrazine (*FD&C Yellow #5*) induces a **reduction in serum and saliva zinc** concentrations and an increase in urinary zinc content with a corresponding **deterioration in behaviour/emotional** responses of the hyperactive children but not the controls."

**Overall Nutrient Intake of Preschool Hyperactive and Normal Boys**, Kaplan B et al, *Journal of Abnormal Child Psychology*, April 1989, Vol. 17(2), pp.127-32

"... nutrition-behavior interactions are more likely a function of **idiosyncratic sensitivities**, rather than a general tendency for ADDH children to eat differently..." ("ADDH" is an alternate of "ADHD")

**Dietary Replacement in Preschool-Aged Hyperactive Boys**, Kaplan B et al, *Pediatrics*, 1989, Vol. 83, pp. 7-17

"**More than half the subjects exhibited reliable improvement in behavior and negligible placebo effects.** In addition, several nonbehavioral variables tended to improve ... particularly halitosis, night awakenings, and latency to sleep onset."

**Oligoantigenic Diet Treatment of Children with Epilepsy and Migraine**, Egger J, Carter CM, Soothill JF, Wilson J, *J of Pediatrics* 1989 Jan; 114(1): 51-8

*Of 45 children with epilepsy and recurrent headaches, abdominal symptoms, or hyperkinetic behavior, 36 [80%] improved on an oligoantigenic diet.* "... **Headaches, abdominal pains, and hyperkinetic behavior** ceased in all those whose seizures ceased, and in

some of those whose seizures did not cease. ...Of 24 children with generalized epilepsy, 18 [75%] recovered or improved ... as did 18 of 21 [85%] children with partial epilepsy. In double-blind, placebo-controlled provocation studies, **symptoms recurred in 15 of 16 children [94%]...**

**Oral Provocation Tests with Aspirin and Food Additives in Asthmatic Patients**, Hong SP et al., *Yonsei Med J*, 1989. Dec.30(4); pp.339-45.

"Aspirin and food additives are known to induce bronchoconstriction, angioedema or urticaria in susceptible patients ... **Significant bronchoconstrictions** were found in 15 (42.7%) of the 36 subjects tested..."

**Synthetic Food Colourings and "Hyperactivity": a Double-Blind Crossover Study**, Rowe KS, *Australia Paediatric Journal*, April 1988, Vol. 24 (2), pp. 143-7

*40 of 55 children (72.7%) put on a 6-week trial of the Feingold Diet "... demonstrated improved behaviour."*

**Food Allergy in Asthma. Diagnostic Significance of Peripheral Eosinophils**, Longo G, Scornavacca G, Strinati R, Poli F, *Pediatrics Medica e Chirurgica*, 1987 Nov-Dec;9(6):663-8

"The **post diet change** of spirometric [*lung capacity*] values was **significant.**"

**The Impact of a Low Food Additive and Sucrose Diet on Academic Performance in 803 New York City Public Schools**, Schoenthaler S et al, *International Journal for Biosocial and Medical Research*, 1986, Vol. 8(2), p.185-195.

" ... lowered sucrose, synthetic food color/flavor, and 2 preservatives (BHA and BHT) over 4 years in 803 public schools was followed by a **15.7% increase in mean academic percentile rating...**"

**Dietary Influences on Neurotransmission**, Zeisel SH, *Advances in Pediatrics*, 1986; 33, pp.23-47

"**Diet clearly influences neurotransmission.** ... Other components of the diet that may affect behavior include food additives... Given that there is little potential for harm and that there is a subpopulation that may respond, a trial of a **diet** that contains no food additives may be a **valid diagnostic approach** for children with attention deficit disorder..."

**Effect of maternal dietary exclusion on breast fed infants with eczema: two controlled studies,** Cant AJ, Bailes JA, Marsden RA, Hewitt D, *British Medical Journal* (Clin Res Ed) 1986 Jul 26; 293 (6541):231-3

"Thirty seven breast fed infants with eczema were studied to see whether changes in their mothers' diets affected their skin condition ... **Maternal dietary exclusion** seems to benefit some breast fed **babies with eczema.**"



**Food Additives as a Source of Behavioral Disturbances in Children,** Weiss, B, *NeuroToxicology*, 1986, 7(2): 197-208

"The human data are supported by the laboratory animal experiments..." He quotes Philip Handler (1979) on **risk-benefit analysis:** A sensible guide would surely be to reduce exposure to hazard whenever possible, to accept substantial hazard only for great benefit, minor hazard for modest benefit, and no hazard at all when the benefit seems relatively trivial."



**Controlled Trial of Oligoantigenic Treatment in the Hyperkinetic Syndrome,** Egger J, Graham PJ, Soothill JF, Carter CM, Gumley D, *The Lancet*, March 9, 1985

62 of 76 overactive children (81.6%) **improved**; other symptoms such as headaches, abdominal pain, and fits, also improved.



**Value of Oral Provocation Tests to Aspirin and Food Additives in the Routine Investigation of Asthma and Chronic Urticaria,** Genton C et al., *Journal of Allergy and Clinical Immunology* 1985, Jul;76(1); p.40-5

In 20 of 34 patients with asthma or urticaria, "a diet free of additives and nonsteroidal anti-inflammatory drugs **resulted, within 5 days, in a marked improvement of symptoms,** which persisted..."



**Clinical Spectrum of Adverse Reactions to Tartrazine,** Collins-Williams C, *J Asthma* 1985; 22(3): 139-43

"Tartrazine (*E-102, Yellow #5*), a common additive in foods and drugs, often causes adverse reactions such as recurrent **urticaria, angioedema, and asthma** and is frequently implicated in **hyperkinesis**. This paper summarizes the recent literature on the subject ..."

**Development of Locomotor Activity of Rat Pups Exposed to Heavy Metals,** Ruppert PH, Dean KF, Reiter LW, *Toxicol Appl Pharmacol* 1985 Mar 30;78(1):69-77

"Cadmium (Cd), triethyltin (TET), and trimethyltin (TMT) are heavy metals which are neurotoxic to developing animals. ... **A single exposure to Cd, TET, and TMT produced hyperactivity by the end of the preweaning ...**"

Here again, for mice and rats, exposure to various toxins results in hyperactivity.



**Adverse Reactions to Foods,** Allen DH et al., *Medical Journal of Australia* 1984, Sep 1; 141 (5 Suppl): S37-42

"...This (*the discovery of IgE in the 1960's*) ... has resulted in considerable confusion in the minds of both the public and the medical profession on the subject. In the majority of patients presenting with food intolerance ... **symptoms are precipitated by various small, non-immunogenic organic molecules present in the food as natural or added ingredients.** These reactions are pharmacological rather than immunological in nature, although ... resulting in similar symptoms."

Dr. Feingold had written this in his medical textbook, *Introduction to Clinical Allergy*, published in 1973.



**Is Migraine Food Allergy? A Double-Blind controlled Trial of Oligoantigenic Diet Treatment,** Egger J et al., *Lancet* 1983 Oct 15; 2(8355): 865-9

"**93% of 88 children with severe frequent migraine recovered on oligoantigenic diets** ... Associated symptoms which improved in addition to headache included abdominal pain, **behaviour disorder**, fits, asthma, and eczema ..."



**The Role of Diet in Behaviour,** Feingold BF, *Ecology of Disease*. 1982. 1(2-3) pp.153-65

"The increase in behavioural disorders accompanied by a persistent drop in scholastic performance coupled with the continuing rise in the prevalence of delinquency is undoubtedly one of the most important expressions of the disruption of nature by the rising concentration of pollutants in the ecosystem . . . **Public recognition and participation in the problem are mandatory to correct the insidious downgrading of the human race, which is already evident.**"

Dr. Feingold finished this paper a few days before his death, and it was published posthumously.

**Physiological Changes in Hyperactive Children Following the Ingestion of Food Additives**, Salmay J, Shucard D, Alexander H, Peterson D, Braud L, *International Journal of Neuroscience* 1982 May;16(3-4):241-246

"... physiological measures [*EEG and heart rate*] were obtained prior to and following the ingestion of drinks containing food additives or placebos.. ... **physiological changes** in the hyperactive children were greater in response to ingestion of the **additives** than to placebo. These physiological findings are consistent with behavioural data indicating that **some hyperactive children are adversely affected by food additives.**"

**Effects of Toluene Inhalation on Locomotor Activity and Brain Catecholamine Levels in Rats**, Yamawaki S, Sarai K, *Yakubutsu Seishin Kodo* 1982 Jul;2(1):57-9

"...The inhaling of toluene vapor ... induced the **increase in spontaneous locomotor activity...** " (*Toluene is a solvent made from petroleum or coal tar*)

And again, for mice and rats, exposure to various toxins results in hyperactivity.

**Food Additives and Environmental Chemicals as Sources of Childhood Behavior Disorders**, Weiss, B, *J American Academy of Child Psychiatry* 21,2:144-52, 1982.

As a toxicologist, Dr. Weiss analyzed several early "negative" studies, and concluded, "the Feingold hypothesis, in principle, **is supported by experiments that meet scientific criteria of validity...**"

**Neurotransmitter Release from a Vertebrate Neuromuscular Synapse Affected by a Food Dye**, Augustine G, Levitan H, *Science Magazine*, March 28, 1980, Vol. 207, pp. 1489-90

"...FD&C No. 3 ... produced an irreversible, dose-dependent **increase in neurotransmitter release** ... These results suggest that erythrosine might prove a useful pharmacological tool for studying the process of transmitter release, but that **its use as a food additive should be re-examined.**"

**Food Dyes Impair Performance of Hyperactive Children on a Laboratory Learning Test**, Swanson J, Kinsbourne M, *Science magazine*, March 28, 1980, Vol. 207. pp.1485-7

"The **performance** of the hyperactive children on paired-associate learning tests on the day they received the dye blend **was impaired** relative to their performance after they received the placebo, but the performance of the non-hyperactive group was not affected by the challenge ..."

**Behavioral Responses to Artificial Food Colors**, Weiss B, et al, *Science*, 1980, Vol. 207, 1487-1489

In a study of children who were *not* hyperactive, he concluded: "...modest doses (*he used only 35.26 mg dye*) of synthetic colors, and perhaps other agents excluded by elimination diets, **can provoke disturbed behavior in children.**"

**Trace Mineral Levels in Hyperactive Children Responding to the Feingold Diet**, Brenner A, *Journal of Pediatrics* 1979 Jun; 94(6):944-5

*Children who did and children who did not respond to the Feingold diet were tested for zinc and copper levels in their blood. Responders had a higher level of copper. "... bio-chemical difference* may be present in children who appear to be affected by the additives."

**Hyperkinesia and Food Additives: Testing the Feingold Hypothesis**, Harley, JP et al., *Pediatrics*, 1978. June Vol 61 (6) p. 818-827.

Although claiming "no diet effect" in the abstract, Harley admitted in the text that he was "not in a position to refute his [Feingold's] claims regarding the possible causative effect played by artificial food colors in preschool children."

**100%** of preschoolers improved on the Feingold diet in this double blind study, which is nevertheless often quoted as "proving there is no diet effect."

**Is the Australian Version of the Feingold Diet Safe?** Dumbrell S, Woodhill JM, Mackie L, Leelarthaeapin B, *Med J Australia* 1978 Dec 2;2(12):548, 569-70

". . . The **nutritional quality** ... **was superior** to that of the normal diet..."

**Salicylate Sensitivity in Children Reported to Respond to Salicylate Exclusion.** Fitzsimon M, Holborow P, Berry P, Latham S., *Med J of Australia*, 1978. Dec. 2: 2(12); pp.570-572.

In a double-blind study, children 6-14 years old who had improved on the K-P (Feingold) diet were assessed after 40 mg of acetylsalicylic acid or placebo. "Significance was reached in **tests of general cognitive capacity, line walking** and the "**finger-to-nose**" tests, as well as **increased disturbance in sleep patterns** in these children."

Note – this was only half a baby aspirin.

**Effects of Artificial Colors on Hyperkinetic Children: A Double-Blind Challenge Study**, Goyette GH, Connors CK, Petti TA, Curtis LE, *Psychopharmacol Bull* 1978 Apr;14(2):39-40

"... evidence that performance on a **visual-motor tracking** task may be **impaired** following ingestion of challenge material... suggesting that **artificial food dyes do indeed impair and disrupt the behavior** of the children..."



**The Management of Hyperkinetic Children: A Trial of Dietary Therapy**, Hindle RC, Priest J, *N Z Med J* 1978 Jul 26;88(616):43-5

"... Ten hyperkinetic children have been treated with the diet, five of whom **improved dramatically and are now off all other therapy.**"



**Hyperkinesis and Diet: A Double-Blind Crossover Trial With a Tartrazine Challenge**, Levy F, Dumbrell S, Hobbes G, Ryan M, Wilton N, Woodhill JM, *Medical Journal of Australia* 1978 Jan 28;1(2):61-4

"...The rating scales and objective tests for the full sample did not show a statistically significant deterioration ... " a subgroup of the children... indicated a **significant challenge effect**, ... with mothers reporting **more symptoms** during the challenge period..."

Tests were done **a day after** challenge with 5 cookies per day, each with only **ONE** mg of color -- a tiny dose indeed!



**The Functional Relationship Between Artificial Food Colors and Hyperactivity**, Rose TL, *J of Applied Behavior Analysis*. 1978 Winter;11(4):439-46.

"... Two eight-year-old females, who had been on the Feingold K-P diet for a minimum of 11 months, were the subjects studied. The experimental design was a variation of the BAB design, with **double-blind conditions**. . . Results indicated (a) **the existence of a functional relationship between the ingestion of artificial food colors and an increase in both the duration and frequency of hyperactive behaviors**, (b) the absence of a placebo effect, and (c) differential sensitivity of the dependent variables to the challenge effects."

**A Study of the Efficacy of the Feingold Diet on Hyperkinetic Children. Some Favorable Personal Observations.**, Brenner, A, *Clinical Pediatrics*, 1977, Jul; 16(7) pp.652-656.

Brenner observed children who had been unsuccessfully treated by other means. 11 of 32 [**34%**] "**were markedly improved** [on the Feingold diet]... the **startling changes** seen in patients who had been followed for years with other forms of therapy suggest strongly that this **improvement was genuine.**"



**Hypersensitivity to Tartrazine (FD&C Yellow No. 5) and Other Dyes and Additives Present in Foods and Pharmaceutical Products**, Lockey SD, *Annals of Allergy*, 1977 Mar; 38(3); pp.206-10.

"Tartrazine (FD&C Yellow No. 5) and other allowed certified **color additives** may have an **exacerbating effect** in chronic **urticaria and asthma** sufferers..."



**Food Additives and Hyperkinesis: A Controlled Double-Blind Experiment.** Connors CK, Goyette CH, Southwick DA, Lees JM, Andrulonis PA, *Pediatrics* 1976 Aug;58(2):154-66

"A double-blind crossover trial involving a control diet and a diet eliminating artificial flavors, colors, and natural salicylates as recommended by Feingold was conducted on 15 hyperkinetic children ... Both parents and teachers reported **fewer hyperkinetic symptoms on the K-P [Feingold] diet** as compared to the pretreatment baseline ..."



**Allergy Testing, Psychological Assessment and Dietary Treatment of the Hyperactive Child Syndrome**, Salzman LK, *Medical Journal of Australia* 1976 Aug 14;2(7):248-51.

15 allergic children were given the Australian Version of the Feingold K.P. diet. Ninety-three per cent [**93%**] responded with improved behaviour in the areas of overactivity, distractibility, impulsiveness and excitability. Sleep and enuresis problems were resolved partially or completely. **This study demonstrates that the aforementioned elimination diet significantly affects behaviour.**"

Sensitivity to the additives and salicylates are not necessarily an IgE allergy, and a negative allergy test does not rule out a positive response to the diet. Only by a trial of the diet will one know if it can help.

**Food Additives**, *Lancet* 1972 Apr 22;1(7756):887

"The fifteenth F.A.O./W.H.O. report on food additives is concerned with additives in baby foods, and with enzymes, chemically modified starches, and some other chemicals. The food industry's technologists produce new additives, and the committee dutifully ponders on their safety. They are experienced men, so, within the conventions of toxicology, the answers are sensible. ... Enzymes obtained from edible parts of animals or plants are regarded by the Expert Committee as foods, and therefore not as additives, but clearly many active toxic compounds can be extracted and concentrated from normal foods (e.g., oxalic acid from spinach) ... **No routine epidemiological studies are made to find out if food additives are toxic.**"

Today, worse, some additives won't be tested at all because ILSI (aka Nutrition Fdn) says "a little bit can't hurt." (Kroes 2002)

**Health Aspects of Food Additives**, Johnson PE, *Am J Public Health Nations Health* 1966 Jun;56(6):948-51

"...The benefits to public health resulting from use of food additives are great and stem primarily from the role of these chemicals in increasing food production, in conserving foods in storage, and in making foods continuously available in acceptable form through processing. The benefits greatly outweigh any hazard detected by present methods of toxicology and safety evaluation. **That hazards not detected by present methods might exist is recognized...** In the main the only methods available leave more or less justifiable doubts about actual safety for man, about possible effects from long-term ingestion, and about possible additive and synergistic relations among the host of additives and other chemical constituents of foods."



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