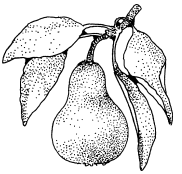
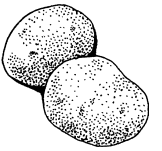
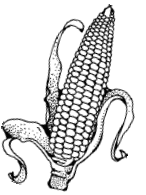
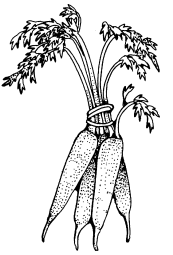


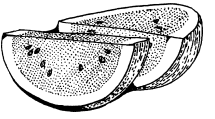


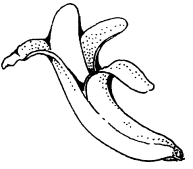


A Parent's Guide to

Diet, ADHD & Behavior





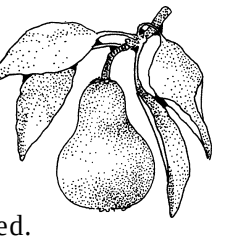


Center for Science in the Public Interest

A Parent's Guide to Diet and ADHD*

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common behavioral problems in children. It not only bedevils children, but also affects their siblings and parents. It can be treated, but not cured. A key question for parents is how to treat their children.

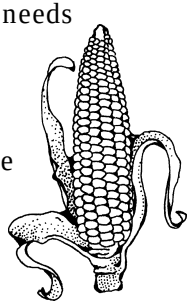
ADHD—also called hyperactivity or attention-deficit disorder—has been diagnosed in millions of American children and adults. The main symptoms in children are reduced attentiveness and concentration, excessive levels of activity, distractibility, and impulsiveness. Before concluding that your child has ADHD, consult a doctor or psychologist who is qualified to make the diagnosis. Many children whose parents think they have ADHD are merely very active or spirited. Besides ADHD, some children exhibit other types and degrees of inappropriate behavior.



Exactly how many children suffer from ADHD is not known. The usual estimates are 3 to 5 percent of school-age children. Using broader diagnostic definitions, some surveys find that the percentage is as high as 20 percent in

* This pamphlet is adapted from *Diet, ADHD & Behavior*, published by the Center for Science in the Public Interest. That report is available from CSPI or its Internet site (www.cspinet.org).

certain subgroups of the population. ADHD is two or three times more common in boys than in girls. On average, at least one child in every classroom in the United States needs help for ADHD.



Researchers generally agree that ADHD has genetic roots. Thus, if one child has the syndrome, his or her siblings have a greater risk of developing it. Because doctors cannot yet diagnose ADHD by using blood analyses, brain scans, or other laboratory tests, ADHD is usually diagnosed by observing a child's behavior, interviewing parents and teachers, and by using a checklist of behaviors, such as those included in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM)-IV published by the American Psychiatric Association. (See box on next page.) Researchers are working hard to develop more reliable diagnostic tools and have found subtle differences in brain structure and metabolism between children with and without ADHD.

ADHD takes an enormous toll on children and their families. The child falls behind in school, loses self-esteem, and needs extra help. A family must cope daily with the need to focus the child's attention on essential activities or restrain his or her impulsive behavior, while dealing with the unsettling fact that the child is not always welcome in other people's homes, in play groups, or on teams. Siblings may suffer because their needs are not as acute, and many marriages suffer from the constant stress

Signposts of ADHD

The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* describes three patterns of behavior that indicate ADHD. People with ADHD may show several signs of being consistently inattentive. They may have a pattern of being hyperactive and impulsive. Or they may show all three types of behavior.

Signs of inattention include:

- becoming easily distracted by irrelevant sights and sounds
- failing to pay attention to details and making careless mistakes
- rarely following instructions carefully and completely
- losing or forgetting things like toys, or pencils, books, and tools needed for a task
- avoiding tasks that require sustained mental effort

Signs of hyperactivity and impulsivity include:

- feeling restless, often fidgeting with hands or feet, or squirming
- running, climbing, or leaving a seat, in situations where sitting or quiet behavior is expected
- acting as if driven by a motor
- blurting out answers before hearing the whole question
- having difficulty waiting in line or for a turn

Because everyone shows some of those behaviors at times, the DSM contains specific guidelines for determining when they indicate ADHD. The behaviors must appear early in life, before age seven, and continue for at least six months. In children, they must be more frequent or severe than in others the same age. Above all, the behaviors must create a real handicap in at least two areas of a person's life, such as school, home, work, or social settings. So someone whose work or friendships are not impaired by those behaviors would not be diagnosed with ADHD. Nor would a child who seems overly active at school but functions well elsewhere.

(Adapted from *Attention Deficit Hyperactivity Disorder*, National Institute of Mental Health, 1994.)

of dealing with an affected child.

Many children outgrow or learn how to control their symptoms. But symptoms sometimes persist into adulthood, making it more difficult to succeed in careers, to start and maintain families, and to become involved in community activities. Adults with ADHD have higher rates of alcoholism, drug use, and imprisonment. Thus, early treatment is crucial.

The Feingold diet

In the early 1970s, Dr. Benjamin Feingold generated a firestorm of excitement and controversy by asserting that certain foods and food additives could trigger ADHD. Feingold, who was Chief Emeritus of the Department of Allergy at the Kaiser Foundation Hospital and Permanente Medical Group in San Francisco, reported that when he prescribed dietary changes for patients with hives, asthma, or other allergic reactions, their behavioral problems (if present) sometimes diminished. He claimed that 30 percent to 50 percent of his hyperactive patients benefited from diets free of artificial colorings and flavorings and certain natural chemicals (salicylates in apricots, berries, tomatoes, and other foods).

Thousands of beleaguered families, eager for drug-free relief for their hyperactive children, tried Feingold's diet. Many reported improvement in their children's behavior. That spurred the formation of Feingold-diet support groups throughout the country to share information and provide assistance to families. For more information contact the

Feingold Association of the United States (P.O. Box 6550, Alexandria, VA 22306; 800-321-3287; www.feingold.org).

But not everyone was impressed by Feingold's claim. The processed-food industry, many child-behavior experts, and many pediatricians reacted to Feingold's claim with skepticism bordering on derision, pointing out that it was based solely on his and parental observations and was not backed by any controlled studies. The reported successes of his diet could be due to something else the families were doing or simply to their wishful thinking, they said, and not necessarily to the absence of certain chemicals in the food.

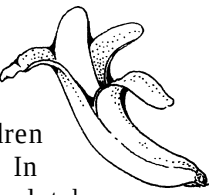
Slowly, researchers began testing Feingold's claim. The first study, conducted by C. Keith Conners and his colleagues at the University of Pittsburgh and published in 1976, found that at least four of 15 children diagnosed with ADHD improved on a diet free of artificial colors and flavors. Over the next two decades, almost two dozen more controlled trials followed, most of which focused on food dyes. In some cases, children were put on a diet that lacked many food additives and then "challenged" with dyes. In other cases, the behavior of children was monitored after they were switched to a diet free of foods that might cause a reaction (dyes, wheat, egg, chocolate, and others) and then challenged with those foods. Most—but not all—of those studies

"I would rather be different because of what I eat than because of how I behave."

Chris, 11 years old, Waldorf, MD

found that some—but not all—children were affected by diet. Some of those "responders" were affected by diet slightly, others dramatically.

In 1982 the National Institutes of Health (NIH) convened a "consensus development conference" on diets and hyperactivity to review the early scientific research and advise health professionals and the public. That NIH panel concluded that food additives and certain foods do, indeed, affect a small proportion of children with behavioral problems. In addition to noting that anecdotal reports claimed "dramatic improvements" in some hyperactive children, the panel concluded that controlled studies "did indicate a limited positive association between defined [Feingold-type] diets and a decrease in hyperactivity." It pointed out that a major limitation of the research was that most studies tested the effect only of dyes and not of other additives and foods that also might promote hyperactivity. It recognized "that initiation of a trial of dietary treatment . . . may be warranted" for hyperactive children. The conference recommended that additional research on diet and behavior be conducted, but over the next decade and a half only scattered research was done. The failure to conduct a broad range of research means that little is known about the percentage of children who respond to dietary therapy, to what degree they respond, which children are likeliest to be affected, the additives and foods that cause problems, and the best ways to use diet therapy.



Concerns about stimulant drugs

Once pediatricians, psychologists, and psychiatrists have concluded that a child has ADHD, they usually prescribe parenting-skills training for parents and behavioral counseling and stimulant drugs for the child. The drug most frequently prescribed is methylphenidate, the most popular brand of which is Ritalin. Other behavioral problems may be treated with other drugs.

Ritalin is often highly effective in reducing the symptoms of ADHD, and millions of children have been treated with it. In recent years, Ritalin's use has increased greatly, with a 2.5-fold increase occurring just between 1990 and 1995.

One reason to consider alternatives to Ritalin is that it and other drugs have troubling side effects. Ritalin and amphetamines (Adderall, Dexedrine) may cause reduced appetite and weight loss, stomachaches, and insomnia. More seriously, those drugs occasionally may cause or exacerbate tics and Tourette's syndrome. Another drug, pemoline (Cylert), has been associated with fatal liver failure, and the Food and Drug Administration (FDA) urges doctors not to use it to treat ADHD. Furthermore, until long-term studies are done, it will not

> *"Our belief that medication should only be a last resort spurred us into action and we began the Feingold program. Within ten days my husband and I agreed that on a scale from 0 to 10, Hannah's behavior had improved from a 0 to about 8.5."*
>
> Mother of Hannah, 7 yrs old, South Pomfret, VT

be known whether years-long treatment in childhood (or adulthood) with stimulant drugs affects the nervous system or other parts of the body later in life.

Adding to the concern about Ritalin is that a study conducted by the federal government's National Toxicology Program (NTP) found that methylphenidate caused liver tumors in mice. Unlike studies in which animals developed tumors only after being fed extraordinarily high dosages of a chemical, the dose of methylphenidate that caused tumors was only several times higher than the maximum recommended dose in humans. (In a separate study, amphetamines did not cause cancer.)

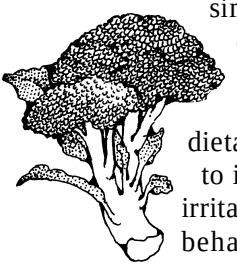
Samuel Epstein, a cancer expert at the School of Public Health at the University of Illinois, says, "The NTP study sends a powerful warning that Ritalin may cause cancer—in the liver or other organs—in humans. Millions of young children take Ritalin for years on end, and children may be especially susceptible to a carcinogen's effects."

The FDA acknowledges that the NTP study indicates "a weak signal of carcinogenic potential," but still considers the drug to be safe. The FDA noted that it did not cause cancer in rats and that the strain of mouse used was especially susceptible to developing liver tumors. There is no evidence that Ritalin causes cancer in humans, but no studies have followed large numbers of Ritalin-users for four or five decades. After all, large numbers of children have been consuming Ritalin for only the past one or two decades, and cancer might not occur until the children reach their 60s or 70s.

Deciding on a treatment

Until some preventive method or cure is developed, parents of a child with ADHD need to determine what therapies to try. On the basis of their concerns about medications, the effectiveness of different approaches, and their child's personality and diet, parents may choose to test their child on a restricted diet, to use stimulant-drug therapy, to use only counseling and behavior-modification techniques, or some combination of those methods.

Many parents have qualms about treating their child with a drug to make him or her behave more appropriately at home and in school. Those drugs are simple to use and often effective, but may have side effects. One possible alternative is a dietary approach, which seeks to identify and remove irritants in foods that cause behavioral symptoms. That approach entails eliminating certain foods from the (unmedicated) child's diet for several weeks to see if his or her behavior improves. In some cases, dietary changes by themselves may adequately reduce behavioral problems. If not, amphetamines or another medication could be tried in addition to, or instead of, a restricted diet.



Treating your child with diet

Numerous studies have demonstrated that the behavior of some children improves when they avoid certain foods. Those children may react to any of a variety of different foods and

ingredients, and some may be affected by more than one. Your goal is to identify the specific foods or additives, if any, that affect your child. What makes that task especially challenging is that children's behavior ordinarily is so variable.

Needless to say, controlling the diets of young children can be difficult, especially once children go to school. Foods containing dyes and other potentially provoking ingredients are advertised aggressively and available everywhere: at supermarkets, restaurants, schools, vending machines, parties, theaters, and the homes of friends and relatives. Many young children are already "hooked" on the very foods that may cause problems, though it is getting easier to find acceptable alternatives. And children who do not eat what all their friends eat may feel left out or stigmatized.

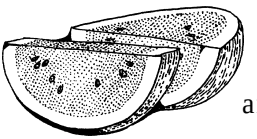
Some parents who have put their children on special diets, though, say that their children willingly cooperate in making dietary changes, especially after they discover that those changes make them feel better. Some older children avidly read labels to avoid certain ingredients.

Some studies suggest that the children who respond best to dietary therapy are young (preschool) and those who suffer from asthma, eczema, hives, hay fever, or similar symptoms. Children who still have significant problems after taking stimulant medications might also be good candidates. But, no matter the age of your child or the exact nature of his or her behavioral problem, it could be

worth trying diet. It is certainly safer and cheaper than using stimulant drugs, and, if your child has been eating a lot of artificially colored foods, it may also be more nutritious. At worst, a modified diet won't help and you've delayed for several weeks trying another option.

Trying a modified diet

Finding a diet that will help your child will require time, patience, and experimentation. We discuss diets that involve varying degrees of change, starting with eliminating only dyes. The most restricted diets begin by eliminating numerous common foods and then add them back one by one to identify any that cause problems.



Numerous studies have demonstrated that some children are sensitive to dyes. Thus, you might start by eliminating only foods (and vitamins, drugs, and toothpastes) that contain artificial colorings.

The Feingold diet, which is based mostly on unconfirmed reports from parents and doctors, eliminates additional additives, as well as "salicylate-containing" foods. That diet eliminates:

- artificial colorings (look for names like Red 40 and Yellow 5 on labels)
- artificial flavorings (including vanillin, used in synthetic vanilla)
- artificial sweeteners (acesulfame-K, aspartame, saccharin, sucralose)
- BHA, BHT, and TBHQ preservatives

One study suggests that sodium benzoate and benzoic acid should also be on that list. The Feingold diet also excludes certain fruits and vegetables, though, again, studies have not demonstrated that they cause problems (see box on the next page for lists of excluded and permitted foods). While that diet excludes many common foods, later you can add back any to which your child is not sensitive.

> *"We began the Feingold diet last Thursday and find it relatively easy to do . . . what was holding me back before??"*
>
> Monica, Williamsville, NY

Once you have decided which foods and additives you will eliminate, check all the foods in your refrigerator, pantry, and cupboards. Remove or discard any foods that contain banned ingredients. Learn about the ingredients used by the restaurants you frequent, though during the test period it may be best to stick mostly to foods you prepare at home. Major fast-food chains offer lists of the ingredients in their products; ask servers or call their consumer-affairs offices. The Feingold Association publishes lists of selected packaged and chain-restaurant foods that fit into the diet, but you'll have to become a careful label reader and inquisitive restaurant-goer to learn the ingredients in your children's favorite foods.

Once you are set to go, put your child (and the rest of the family, if possible) on the modified diet for two or three weeks. Stick to the diet as carefully as you can. If your child mistakenly eats a prohibited food, don't get upset, just get him or her back on the diet.

Foods Not Allowed on the Feingold Diet (partial list)*

almonds	cucumbers and pickles	peppers (bell, chili)
apples	currants	plums, prunes
apricots	grapes, raisins	tangerines
berries (all)	nectarines	tea
cherries	oranges	tomatoes
cloves	peaches	
coffee		

aspirin (acetyl salicylate) and medications that contain it

oil of wintergreen (methyl salicylate; mint flavoring)

**Reactions to these foods are based on unconfirmed reports, not controlled studies.*

Foods Allowed on the Feingold Diet (partial list)

Fruits

banana	honeydew	papaya
cantaloupe	kiwi	pears
dates	lemons	pineapple
grapefruit	mangoes	watermelon

Vegetables

bean sprouts	cauliflower	peas
beans (all types)	celery	potatoes
beets	kale	spinach
broccoli	lentils	squash
Brussels sprouts	lettuce	sweet corn
cabbage	mushrooms	sweet potato
carrots	onions	zucchini

You should use a notebook to keep track of your child's behavior before and after you put your child on the diet. Prepare a score sheet (see box on next page) based on common characteristics of ADHD, but modify that to include your own child's most troubling behaviors. Use a separate page for each day. Note when behavior problems arise and which foods your child had eaten recently. You also can ask your child's teacher if he or she has noticed any improvement in behavior, but don't say that you're changing your child's diet unless you need his or her assistance to provide your child with special snacks.

Improvements in behavior should serve as great positive feedback to stay on the diet. However, it might just be a coincidence that a child's behavior improved when the diet was introduced. Parents should try to be objective and not let their expectations color their views of their child's behavior.

> *"My 11-year-old son finds great joy in reading labels and discovering a new food that we can try."*
>
> Tricia, Eldorado Hills, CA

To try for even greater improvement, you can try eliminating more of the additives or foods that are suspected of affecting behavior. Likewise, if your child's behavior did not improve on the initial diet, it could mean that your child is not affected by foods at all or is sensitive to other foods. It is also possible that prohibited ingredients are sneaking into your child's diet.

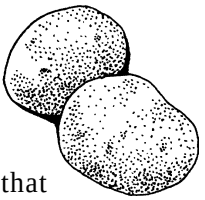
Behavior Scoresheet

Date:____

Behavior	Good - 0	Mild - 1	Moderate - 2	Severe - 3	Possible food cause
Easily distracted by irrelevant sights and sounds					
Not paying attention to detail, making mistakes					
Losing or forgetting toys, pencils, etc., necessary for tasks					
Restless, fidgety					
Running around when quiet behavior or sitting is expected					
Difficulty waiting in line or for a turn					

Adapt this form for your child's behaviors.

Try, and try again



If the initial dietary changes had little or no benefit, and you excluded only dyes, try putting your child on the complete Feingold diet. If that doesn't help, the Feingold Association, recommends, based on parents' experiences, eliminating:

- corn syrup, high-fructose corn syrup, and corn sugar (in soft drinks and other sweetened foods)
- MSG (monosodium glutamate) and HVP (hydrolyzed vegetable protein, which contains some glutamate)
- sodium nitrite (in luncheon meats)
- calcium propionate (in baked goods)

After several weeks, if your child's behavior has improved, every few days you could add back one eliminated food or ingredient at a time to see if it causes a problem. You'll need to repeat that two or three times to confirm that the food is really a culprit. Knowing which foods do not pose problems allows your child to eat a wider range of foods.

The "few-foods" diet

If your child's behavior did not improve on the Feingold diet you could try a "few-foods" diet, which involves more extensive restrictions. Studies indicate that some children are sensitive not just to food additives but also to such foods as:

- wheat
- eggs

- milk and other dairy foods
- chocolate
- soybeans/tofu
- corn products (including corn sugar and syrup)

On this diet, you would eliminate as many of those foods as you can, plus artificial colorings and other additives. Children can eat fresh meat and poultry, any vegetable (except corn and soybeans), fruits and fruit juices (but not citrus fruit/juice and not beverages normally consumed daily), rice, and oats. You should seek assistance from an allergist if you undertake an elimination diet, especially if your child has eczema or other allergies (severe reactions might occur when a food is reintroduced).

The more foods you try to eliminate, the more complicated it will be to provide healthy meals and win your child's cooperation. Fortunately, most of the restrictions will be temporary, because you will be trying to identify the foods that do not cause problems, as well as those that do.

Keep your child on the few-foods diet for two weeks, tracking his or her behavior until you notice two consecutive days of significantly improved behavior. Again, we note that it can be difficult to distinguish an effect of diet from your child's normal fluctuations in behavior. If you do not notice any improvement, you can end your experiment.

If you have noted improved behavior, add back to your child's diet one of the eliminated foods or additives at a time. After your child has eaten that food for several days in a row, note in your diary

any symptoms that develop. If that food did not affect your child, then consider it safe to eat. If your child's behavior deteriorated, leave that food out of the diet or retest it again later. Every few days add back another food and keep track of how your child reacts. Gradually, you may be able to identify foods that do and do not affect your child.

If your child stays on a sharply restricted diet for more than a few weeks, you should work with a dietitian to plan a diet that provides all the nutrients your child needs. Also, your child should take a daily vitamin-and-mineral supplement, which makes sense regardless of what diet he or she is on.

Another approach is to feed your child the few-foods diet until you see an improvement. Then add back *everything* —dyes, wheat, the works—for several days to see if *anything* triggers a reaction. If your child's behavior worsens, return your child to the special diet and add back foods one by one until you find the problems.

Finally, don't expect diet to bring about miraculous improvements in behavior. Even in kids who are affected by food ingredients, eliminating the culprits often yields only a partial improvement. But even partial improvements could be most welcome. If your child does not benefit significantly from a restricted diet, you should discuss with your pediatrician other treatment options, including medications and behavioral counseling.

Good Nutrition

Whether or not your child has ADHD or other behavioral problem, he or she should eat a nutritious diet. Most children eat far too many fatty, salty, and sugary foods—from burgers, fries, cheese, and ice cream to soft drinks, potato chips, and candy. And few children get the vitamins, minerals, fiber, and phytochemicals they need from fruits, vegetables, and whole grains. It is important to your child's current and future health to eat a really healthful diet (and that may mean that *you* need to improve your own diet to set a good example!). First steps include getting rid of the junk foods in your home, putting fatty and sugary foods off-limits when eating out, and turning off television shows riddled with junk-food ads. Also, give your child a daily vitamin-and-mineral supplement.

CSPI is a nonprofit health-advocacy organization. The contents of this pamphlet are not intended to provide personal medical advice, which should be obtained from a qualified health professional.

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