

*Dr. Kenneth Condrell will resume his column-writing duties in the fall.*

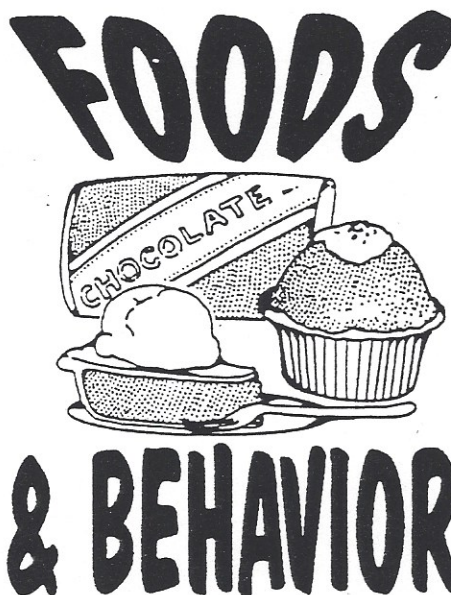
## What Every Parent Wants

by: Dr. Warren D. Keller

All parents want their children to be happy, healthy and well behaved. We are becoming increasingly aware that good nutrition and healthy eating are an important means to accomplishing this goal. As one famous neuropsychologist puts it, "The heart pumps blood and the brain pumps behavior." The brain is driven by a complex interrelationship of neurotransmitters, and the neurotransmitter chemicals are derivatives of the foods we eat. Therefore, it makes sense that foods can affect behavior. Drugs and foods are both chemicals, and foods, like drugs, may have psychoactive effects. Foods may well affect both our minds and our behavior—a notion that is hundreds and hundreds of years old.

Anecdotes in medical journals about the possible relationship between sugar and hyperactivity in children date back to at least 1929. Nevertheless, attempts to discover the specific ways in which foods impact on children's behavior have been unsuccessful. This has probably been due to several factors, such as the differences in the ages of the children being studied as well as individual differences in body chemistry. We also know that responsiveness to drugs may differ among individuals and that some psychoactive drugs will have the opposite of their intended effects. The same may be true of the foods that we eat.

The relationship between foods and behavior is receiving increasing attention by research psychologists, and I suspect



that over the course of the next several years we will be hearing more and more about the relationship between foods and children's behavior. During the 1960s and 70s, many studies were conducted that investigated this relationship, and for the most part they concluded that there was scant evidence to suggest such a relationship. This was especially true regarding the relationship between sugar and behavior.

Theoretically, sugars and other carbohydrates should increase the amount of serotonin available to the brain which should then produce sleepiness and drowsiness. In fact, several studies investigating the role of sugar on children's behavior have found that large doses may

actually result in lethargy and a lowered activity level. Despite this, parents repeatedly tell us about their children being "off the walls" when they eat foods containing large amounts of sugar.

The consumption of sugar in our diets is increasing at a rapid pace, accounting for, on average, 20% of the caloric intake of the average American adult. Some studies investigating the relationship between sugar and behavior in children have found that children consume as much as 40% of their daily calories in the form of refined sugar. A University of Florida study conducted in 1980 compared preschoolers who consumed large amounts of sugar with preschoolers who consumed little sugar and found that those children who fell within the top 25% of sugar intake performed more poorly on measures of attention. Other studies revealed a positive correlation between high sugar consumption and aggressive behavior in children. In general, young children, especially preschoolers, are more likely to evidence adverse effects of high sugar consumption. Research has shown that older children are less likely to experience detrimental effects on their behavior as a result of high sugar consumption.

Dr. Keith Connors, a neuropsychologist who has an extensive research and clinical background in the treatment of hyperactive children, also has a special interest in the relationship between foods and behavior. He has speculated about the

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Psychologist Warren D. Keller is a member of The Condrell Center and specializes in pediatric psychology and neuropsychological evaluations. His work includes psychological evaluations and treatment of children

and families, as well as infant evaluations helpful in identifying delays in development.

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## Foods and Behavior *continued*

factors that might be involved in the inconsistent effects of sugar on behavior. In research that he has conducted in hospitals, Conners has suggested that children who are hyperactive may metabolize sugar, or glucose, differently. One study revealed that 88% of a sample of children with an Attention Deficit Hyperactivity Disorder (ADHD) had an abnormal glucose tolerance test, which might support his hypothesis about glucose metabolism in hyperactive children.

Dr. Conners also speculated that other foods that are ingested along with the sugar may interact to produce some of the adverse effects that we sometimes see, making the specific relationship between sugar and behavior more difficult to observe. He compared average children with hyperactive children and gave them either a sugar drink or a Nutrasweet drink in the morning. He also varied their breakfast, giving them either a high carbohydrate meal or a high protein meal. He found that the sugar effects depended upon which of these foods were eaten along with the sugar at breakfast. When hyperactive children ate a heavy carbohydrate breakfast and then received sugar, their attention and performance were far poorer than when they received Nutrasweet. On the other hand, hyperactive children who ate a protein breakfast followed by sugar actually showed better attention than the children who were receiving a placebo.

Dr. Conners also found, consistent with other findings, that the sugar effects were more pronounced for the younger children. This may suggest that it is less likely that hyperactive children run around a lot, use up a lot of energy, and then consume high levels of sugar and carbohydrates. The hyperactive behavior may not be causing the high sugar intake, but it may well be that sugar may have negative or positive effects for children, depending upon their age, their diet and their individual biology. Conners' research also suggests that protein may play a protective role in children's diets.

Hyperactive children who receive stimulant medication for treatment of their ADHD often show the roller-coaster syndrome in their behavior functioning. One day their behavior is horrid, followed by a day of near-perfect behavior. It may

well be that certain foods ingested may interact with the medication to allow more or less of it to be absorbed by the body. The psychopharmacological task for these children is typically to increase the Dopamine and Norepinephrine levels. Tyrosine, a protein found in foods, should also increase Dopamine levels. Tryptophan, an amino acid found in foods, will affect serotonin levels, and we know that increasing serotonin will typically result in drowsiness and sleep. Turkey and milk are two foods that are rich in tryptophan, and it is likely more than coincidence that most of us will become lethargic and sleepy after a Thanksgiving dinner or will take a warm glass of milk to help make us sleep at night.

Dr. Conners is continuing to investigate ways in which dietary management of hyperactive children may either supplement or replace the role of medication for children with ADHD.

Other researchers are also showing renewed interest in the role of foods on our behavior. Dr. Barry Garfinkel, a psychiatrist at UCLA, also has a special interest in treating children with ADHD. He advocates a multimodal treatment approach for these children, with counseling, remedial education, group psychotherapy, physical education, parent management training, and even dietary management as an important adjunctive treatment for a select group. He has reported on preliminary studies in which he found that approximately 30% of his sample of hyperactive children may be especially sensitive to certain foods. He feels that the children who respond best to dietary management are those hyperactive children who experience headaches or ab-



dominal pain, those who have a history of allergies, eczema, or asthma, and those who may experience tics. Although his findings have not yet been replicated, he reports that this small subset of hyperactive children tend to show exacerbation of their behavior problems after ingestion of milk, eggs, chocolate, oranges, wheat, tomatoes, and nuts. Foods containing

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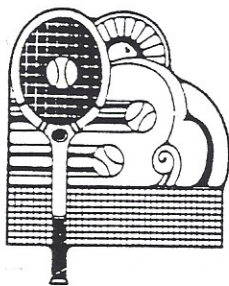


## Tennis continued

age and possibly lose the important innermotivation of playing tennis for enjoyment. "One of the biggest problems in tennis today," emphasizes LaPenna, who is the father of a 2 year old son and a 7 year old daughter, "is that people play tennis for what they're going to get out of it, not because they love it. We don't ever recommend going to major tournaments and traveling the circuit until kids are 14 or 15 years old. We have kids that we take to tournaments just to let them see what it's like, to have them get a feel for the competition and to help them get the urge to try to make it to that level."

Grand Slam winners come along "once in a million" says LaPenna, who seems pleased enough by the fact that Village Glen has turned out 10 or 11 nationally-ranked kids in the last four years. But you don't have to be a kid to enjoy and excel at tennis. LaPenna didn't begin playing tennis until he was 27 years old. "You can start at this game at an old age and still achieve a lot and enjoy it to an unbelievable level. I became a good tennis player at a time when most people would say you're silly to get into the game; it's too hard."

So, all you Moms and Dads out there, it's not too late to add some love (the tennis kind) to your family's life! You can start by calling your town or city recreation department for information on their tennis programs, contacting the Village Glen at 633-1635 or Jim Kramer, Nichols School Tennis Clinic Director at 875-8212.



## Behavior cont.

benzoic acid, a preservative, and foods with tartrazine, a yellow food dye found in squash, pumpkins, and cantaloupes, are also reported to result in heightened problems for these children.

While the relationship between foods and behavior is clearly very complex, it certainly makes sense that foods can affect behavior. Foods become neurotransmitters, and neurotransmitters drive our brains. Brains pump behavior. Though we are still obtaining answers to the many questions we have regarding the relationship between foods and behavior in children, the best advice for dietary management is to provide children a well-balanced diet that is free from excesses of any specific food that is likely to interfere with optimal growth and development.

## Little League cont.

core Little League parents. Typically, parents from both teams yell for a good hit, a good catch or even a good try. Maybe that's because at my son's level in his league, no score is kept. This first couple of games, my son asked who had won. He was initially doubtful that, without winners or losers, they were real games. I convinced him that they are real. After all, there are uniforms. It's just that winning or losing isn't important. It's more about learning the game and having fun. I knew he'd gotten my drift when he responded, "Great. Then no one has to go home sad."

I may not be as good a Little League Mom as I was a Junior Leaguer, but he seems to have gotten the right idea anyway. Besides, at the last game, he hit a homerun!

Judith Cayton is a Buffalo freelance writer.

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