

Feeding the Brain

Excerpts from the book, *Nutrition for Learning: Feeding the Starving Brain*

By Jan Katzen-Luchenta

Spewing yogurt onto his placemat while amplifying his "inside voice" beyond recognition is not behavior typical of Wyatt. And bullying and biting his best friend twenty minutes after arriving at school is certainly not characteristic of Maxie.

When focused, even-tempered Ellen came to school portraying an easily distractible, hysterical child who couldn't follow the simplest of directions, I began to ask myself, "Are little children just naturally moody and impulsive? Is their ability to learn just a crapshoot dependent on the barometric pressure or the day of the week?"

Thoroughly frustrated and exhausted, I decided to do a little investigating. I heard my Montessori teacher trainer's words echo in my ears over and over again—the mantra of the Montessori teacher, "Follow the child, follow the child."

Maria Montessori, an Italian doctor and educator who opened her first Casa Dei Bambini (Children's House), in 1907 was an investigator and educational scientist with an "eye of genius" for child development.

In fact, she introduced an entire methodology for educating children through every plane of development from infancy through university age.

Surely I could draw upon that "eye of genius" that was such an

integral part of my Montessori accreditation. As a student I was required to spend hundreds of hours observing the behavior of infants and children and take detailed notes.

Watching an infant for four hours and documenting his every move, gas bubble and facial expression was no easy task but skillfully re-aligned my rushed adult perspective to a time when life happens in snapshots and little eyes are fixated on the moment with total presence and responsive innocence.

I was determined to identify any and all obstacles that might be corrupting that focus and innocence. And with my students a reasonable place to start was breakfast.

I began my detective work mid-mornings, calling moms and dads as I searched for the faintest preschool dietary clue as to why certain students were attached to the classroom materials by 9:30 AM and others needed the tranquilizer gun.

Rummaging through every child's lunch box, I went undercover, leaving no container or juice carton unturned. In extreme cases, I sniffed and tasted odd-colored "thing-ables" that could not be identified as animal, vegetable, dairy, grain or belonging to any food group for that matter.

I handed the evidence over to several local nutritional gurus. It became clear that the underlying

principle that could be playing a significant role in my students' occasional or habitual emotional outbursts could be inconsistent and improper nutrition.

But, just to make sure, I also perused the books and periodicals in the library. I researched scientific literature and read everything I could find about early childhood education and nutrition as it applies to the little learner's mood, behavior, and ability to focus.

Though intimidated at times by scientific language such as the blood brain barrier and reduced neuronal phospholipid turnover, when I came upon the phrase carbohydrate addiction and brain fog, the language barrier dissolved immediately.

This germinal moment inspired countless hours of research, exploration and inquiry into specific nutrients and patterns of eating that could be affecting my students' ability to focus and learn.

Little did I know that I was also about to uncover the additional powers of these various nutrients and patterns of eating that not only support the development and functionality of the brain, but also are scientifically evidenced to lower the risk of infant and childhood birth defects, cancers and even childhood obesity.

All of this fascinating information was gleaned from the ongoing research, clinical

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findings and journal publications of a vast network of nutritional investigators with an “eye of genius” for nutrition and health.

What really sealed the inevitability of our camaraderie, partnership and dual purpose was a visit to London and participation in the *Generating Healthy Brains* meeting co-sponsored by the McCarrison Society which focuses on nutrition and health, and the International Society for Prenatal and Perinatal Psychology and Medicine (ISPPN).

In light of the 2005 European Brain Council’s press release on the cost of brain disorders amounting annually to 386 billion Euros in 2005, experts from around the world assembled to share their research findings that relate to brain development and subsequent mental health.

As a Montessori teacher and hunter-gatherer in the field of nutritional science and subsequent brain performance, I selfishly hopped on a plane to the UK to glean from the research findings of the world’s greatest nutritional scientists and return to the US with the keys to the kingdom—the formula for nutritional/academic success.

There is a clinical axiom invented by the scientific community that states, “When two scientists agree 95% of the time, you don’t need one of them.”

So what did 14 research scientists from England, Germany, Denmark, Italy and the

US agree on 95% of the time? Several things:

➤ The mounting scientific evidence of the enormous influence of genetics and the maternal diet prior to conception and throughout fetal development.

➤ The impact of nurture including mom and dad’s relationship during pregnancy affecting brain development and childhood behavior.

➤ Overly processed foods (manufactured fats, rendered proteins, and refined carbohydrates) void of essential nutrients correlate with the rising levels of children’s mental and physical ill health.

From the podium, I spoke of the characteristics of “limited” (difficulty concentrating, behavioral problems) and “unlimited” (focused, joyful) learners, their dietary core foods and also how quickly “limited” learners respond favorably to healthier dietary changes, particularly when extra long-chain fatty acids are included.

Call it “the classroom meets the laboratory,” in the words of research scientist and conference chair, Professor Michael Crawford. “It was so special for us to have you help bring realism to the conference,” he told me.

From a teacher’s perspective everything that I heard at the conference crystallized all that

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She is also a scientific writer for the *Nutrition and Health Journal (UK)*, and advisor to the *Mother and Child Foundation*—supporting research for optimal pregnancy outcome and prevention of neurodevelopmental disorders.

Jan is currently the director of a cozy Montessori toddler house located in the historic district of downtown Phoenix, AZ.

Jan is the author of two books, *Awakening Your Toddler’s Love of Learning* and *Nutrition for Learning: Feeding the Starving Brain*. She has also produced a classroom video, *The Making of Great Little People*, which contains segments on home/school curriculum design, conflict resolution modeling, early literacy games and lessons, as well as nutrition.

Visit Jan’s Websites: www.nutritionforlearning.com and her *Nutrition for Learning* blog at <http://www.azcentral.com/families>



I had observed over the years regarding nutritional and emotional influences and the little learner’s ability to function in the classroom.

And so, the realism between nutritional scientists and everyday people like you and me continues. As a society our eating habits, health and behavior are being measured in cohort and double-blind placebo-controlled studies and dissected under the microscope.

The influence of the research findings on our little learners is sobering.

1. Children who eat more French fries than asparagus reverse letters while learning to read and mice fed trans-fatty acids struggle through a maze with reversal learning disabilities.

2. Children who come to school eating breakfast “on the run” are

full of added sugar. Scientists have identified a child's physiological response to sugar to be 10 times that of an adult.

3. "Glow-in-the-dark" confections line bakery shelves while studies indicate irritability and restlessness in children who eat tartrazine (yellow food dye #5) and laboratory mice fed red food dye are spawning offspring with chromosomal damage.

4. Infants from all socio-economic backgrounds are born malnourished. Scientists have identified fetal adipose tissue programmed for later leading to obesity, putting them at risk for diabetes.

5. Babies are born deformed, with preventable mental disorders or low birth weight (with a high risk of brain damage) and researchers consistently identify maternal deficiencies of vital nutrients from whole unprocessed foods born of the earth and sea.

6. Fetuses are growing from embryonic cells that will genetically predispose them to DNA damage while oncology researchers are discovering the protective effect that 12 servings of fruits and vegetables a day—in utero and until the age of two—have against infant and childhood cancers.

Some little learners never make it to preschool. Others make it into preschool and turn into "bigger" learners who join the rising numbers of learning-disabled children embedded in special education programs nationwide.

According to the 2003 Summary of Health Statistics

for US children, learning disabilities are amassing diagnostic numbers close to 5 million annually. In fact, reading failure plagues 80% of the learning disabled? Autism is now reaching epidemic proportions.

At the round table where the fate of many children is decided by recommendations from teachers, school administrators, remedial specialists and health professionals, children are still getting left behind.

A child's performance assessment should include a dietary intake form which covers typical meals and snacks eaten daily, as well as added sugar and dietary fat intake, not just for added calories but for brain function. Until it does, we must take matters into our own hands and educate ourselves.

This includes nutrient-specific guidelines for couples prior to conception and for mothers-to-be throughout each trimester of pregnancy. Foresight cancels out hindsight!

If you think that you are already feeding your child with the utmost of consciousness, you probably are. However, in the words of holocaust survivor and family friend Harry Spitz, "There's always room for improvement."

When I see an entire classroom change from sufficiently engaged to positively grounded in activity just by adding another ¾ cup of walnuts to the oatmeal-cookie oatmeal, I find that proteins feed the brain better when they are complete and no amino acid—or child—gets left behind.

I would be negligent if I didn't

Includes important topics such as:

Nutrition basics; how nutrients work, why all calories are not created equal, the friendlier side of fat, a comprehensive look at vitamins and minerals including Foresight - preconceptual/prenatal nutrition and weaning.

Raising your family's nutrient quotient (NQ) - helping to prevent neuro-developmental disorders, mental ill health and obesity.

The importance of dietary essential fatty acids "daily" to support vision, concentration and mood.

Characteristics of "limited" and "unlimited" learners and the core foods they are eating

Identifying foods that might be triggering learning and behavioral problems.

Prescription for change; food balancing, fats, and focusing - snack and meal plans for families and schools.

Hands on recipes for children of all ages.

Finally, a book for parents-to-be, parents, teachers, school administrators, health professionals and anyone involved with children on supportive nutrition for learning.

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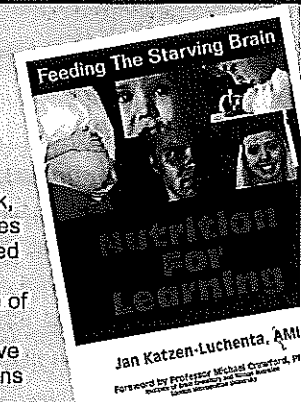
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prioritize the general health of the newborn and the effect of the mother's nutritional status first and foremost as the goal of this article.

My book, *Nutrition for Learning*, began as a quest for answers to nutritional effects that plague little—and big learners—behaviorally.

I see now that these problems were precipitated by a lack of vital nutrients needed for healthy brain function.

Every child wants to learn. Having the proper nutrients to focus and attend is truly a science whose time has come. Mothers-to-be hold the tastes of the foods that could determine their newborns future intelligence.

Fatty Acids

Please note that many of the children's snacks which follow include one or several fat sources.

Breast milk is 60 per cent fat. So is the human brain.

Saturated fat (cholesterol) builds the myelin sheath that covers the nerve fibers between neurons (white matter). It expedites action potential like the high speed internet. Good saturated fat is found in free range animals (grass fed) and their by-products.

Though most of the myelinization process occurs during infancy it continues into adulthood. Fat restricted diets (low fat) imposed on children too soon can cause failure to thrive as well as brain dysfunction later in life.

Mono-unsaturated fatty acids, such as olive oil and avocados, helps build the myelin sheath as well.

The cerebral cortex is composed mainly of neurons in the cerebral gray matter, which has thousands of discrete areas of membranes responsible for neurotransmissions. These areas, as well as the retina, are extremely rich in long chain polyunsaturated fatty acids. Long chain polyunsaturated fatty acids are found in plant, seed, nut and marine sources.

Snacks to Support Learning

Remember, it is important to consult with your health provider when you plan to implement any dietary changes.

Snack/Meal Ideas

Children need nutrients—
not goldfish!

➤ Serve warm whole grain bread (germ and bran intact) with an extra virgin olive oil/canola oil mixture (50/50) for dipping.

Make sure the canola oil is unrefined, cold-pressed from a health food store. The canola oil is rich with omega-3 fatty acids and the olive oil is healthful monounsaturated oil that helps the cells absorb more

of the delicate omega-3 fatty acids from the canola oil.

Serve with cut-up fruit and raw vegetables.

➤ Add flax meal or finely chopped walnuts to your child's oatmeal or whole grain cereal in the morning.

➤ Make a canola oil/ butter sauce to put on cooked vegetables, rice or grains.

➤ Make a tuna, shrimp, scallop, cod or salmon pasta salad using canola mayonnaise and colored beet or spinach pasta.

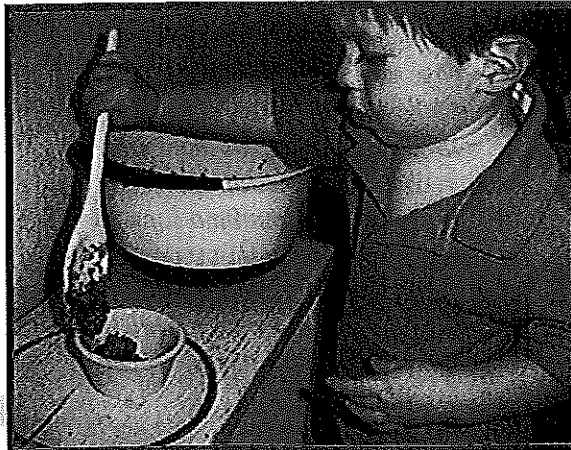
➤ Brush on a canola oil/ barbecue sauce (using brown sugar, low sugar ketchup and soy sauce) over broiled chicken, salmon, beef, etc.

➤ Add canola oil to hummus for dipping vegetables and whole grain pita bread.

➤ Make a canola cheese crisp whole grain corn tortilla. Brush canola oil over melted cheese and onto the edges of the tortilla for moist, chewable edges. Serve with guacamole.

➤ Make a canola or walnut/granola using rolled oats, whole grain flaxseed cereal, finely chopped walnuts, canola or walnut oil, brown sugar, honey (only for children over 18 months to insure against clostridium toxicity) or maple syrup, finely chopped apples and raisins.

➤ Make a trail mix using rolled oats, dried fruit, sunflower seeds, pumpkin seeds, cashews, organic maple syrup and a touch of butter and vanilla.



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Pumpkin seeds are a nutritional powerhouse containing protein, vitamin A, B3, E, folic acid, magnesium, manganese, calcium, zinc, iron, potassium and selenium.

Sunflower seeds are also nutrient trail blazers—vitamins E, B1, B5, folic acid, manganese and magnesium, selenium. All of this fits into those tiny little seeds?

➤ Add olive oil, canola oil (50/50), finely chopped olives and Parmesan cheese to whole grain or protein-enriched pasta.

➤ Make a walnut oil dressing for fresh fruit and vegetable salads. Remember 9-12 a day!

➤ Mix walnut oil with a touch of maple syrup and vanilla in plain yogurt, flax meal. Cut-up fruit optional.

➤ Use an ice cream parfait glass and layer in plain or low sugar yogurt—cottage cheese or tofu can also be used—finely chopped walnuts, chopped bananas, raisins or seasonal fresh fruit.

➤ Spread hummus and cream cheese spread on a whole grain or sprouted bread. Serve with orange sections.

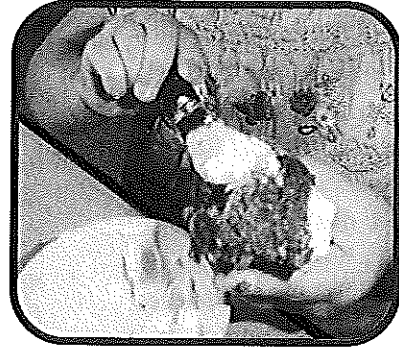
➤ Make a tuna fish, salmon, chicken or egg salad sandwich with canola oil mayonnaise.

➤ Make a blended smoothie with yogurt, canola oil, organic maple syrup, frozen fruit, flax meal. Serve with whole grain or sprouted grain toast.

➤ Cook whole grains (quinoa, bulgur wheat, brown rice etc.) Add butter, raisins, crushed walnuts, Greek style yogurt. Serve on cantaloupe.

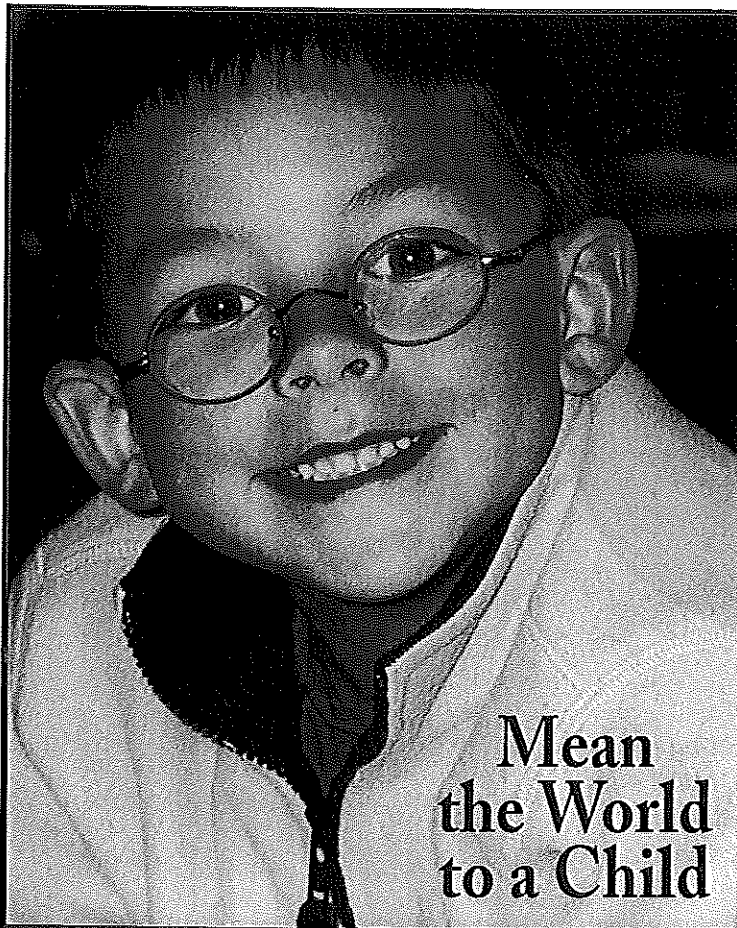
➤ Fill whole grain tortillas with organic beans and mango.

➤ Butter whole grain toast and serve with apricots and cream.



➤ Spread a whole grain bagel with peanut, almond, soy or pumpkin seed butter, vanilla soy milk (no carrageenan which is a carcinogen). Or serve on an under-ripe banana which is lower on the glycemic index chart.

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Mean
the World
to a Child

If helping a child take on the world appeals to you, then you may be right for the Princeton Center for Teacher Education (PCTE). Founded in 1989, PCTE trains adults to find and cultivate the maximum potential in every child as the focus of its American Montessori Society (AMS) and MACTE accredited teacher education program. Its world-class facility within the Princeton Montessori School offers a hands-on learning experience by a highly trained and experienced faculty. PCTE graduates are certified AMS teachers of the Infant and Toddler, Early Childhood or Elementary level. But the world waits for no one, so hurry. **Contact PCTE today.**

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- Serve organic sugar free baked beans with whole grain crackers for dipping (no trans fats/hydrogenated or partially hydrogenated vegetable oils).
- Spread mild organic chili, whole grain buttered tortillas.
- Mix ricotta cheese, yogurt, or cottage cheese and flax meal, with fresh strawberries. Sweeten with natural maple syrup.
- Make romaine lettuce roll-ups with beans, chicken breast or lean meat. Use canola mayonnaise for dipping.
- Make pizza on whole grain pita, tomato sauce, raw vegetable pieces such as spinach, broccoli, etc. and melted cheese.
- Make a spinach salad with soy bacon, sun dried tomatoes, mild cheese or grated hard-boiled eggs. Add olive/canola oil and/or thousand island dressing with canola oil mayonnaise and low sugar ketchup.
- Make protein enriched pasta with tomato and meat sauce.
- Serve a handful of nuts (Brazil nuts, almonds, walnuts, etc.), seeds (sunflower, pumpkin, squash, etc.) and dried fruit (apples, dates, raisins, peaches, apricots, etc.). Nuts and fruits should be chopped fine for the littlest of learners).
- Stuff celery with cream cheese and olives, peanut butter, with a wholesome soft cheese spread or with hummus.
- Serve mild salsa, avocados on whole grain corn tortilla chips.
- Cut up raw or cooked

vegetables. Add unsweetened blue cheese dressing or thousand island dressing made with canola oil mayonnaise and low sugar ketchup.

➤ Thaw organic frozen peas, green beans and/or edamame beans. Let these thaw out in the refrigerator overnight. Serve right away to prevent the items from becoming too watery.

➤ Make available fresh apples, pears, oranges, mangos, papaya, apricots or make a mix of organic frozen peaches, blueberries, strawberries, raspberries and blackberries.

➤ Use whipped cream cheese with a few teaspoons of any vegetable (broccoli, cauliflower, etc.) olives and/or smoked salmon for dipping. Use with whole grain crackers, etc.

Whoops. I just realized I didn't put a line in about children rolling up their sleeves and helping to prepare the snack and cleaning-up.



Additional Tips

Always observe the eating habits of your small children. Make sure eating is always modeled and children learn to chew their food

and swallow before taking another bite.

Not only is food preparation a vital skill to teach children, it helps increase developing focal ability, and initiates a communal family setting where sense of purpose, cooperation and contribution flourish.

Make sure your child has a dietary source of DHA (docosahexaenoic acid) daily to ensure good vision, brain function and mood. Nordic Naturals makes a delicious chewable gel cap. An assortment of wild fish is also recommended (even for pregnant women). The benefit outweighs the potential toxicity.

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