Food for Thought: You Feel What You Eat

An interview with Merrily Kuhn, RN, PhD, ND, PhD

By Nancy Eichhorn, PhD

'Let food be thy medicine and medicine be thy food'.

Today's researchers and health care professionals are realizing the importance of Hippocrates' early pronouncement as they investigate associations between precursors and cures for what ails our population.

Mood disorders such as depression, anxiety, panic attacks, along with gastrointestinal related syndromes (irritable bowel syndrome, eating disorders), obesity, chronic pain, and concentration issues and related memory loss are on the table. Food—the quality of our diet and the feelings related to what we eat, when we eat, why we eat—and what happens with the ingested nutrients—the gut-brain-microbiota axis—are under microscopic exploration as researchers scan for new views on eating and its disorders. One focus is to create a continuum from healthy eating practices to disordered eating behaviors while researching the affects in the human body (McMartin, Willows, Colman, Ohinmaa, Storey, & Veugelers, 2013; Muele & Vogele, 2013).

Mood and Food

Brain chemicals such as neurotransmitters (e.g., dopamine, acetylcholine, and serotonin) influence what we think and feel and how we behave. Most people accept that fluctuations in blood sugar levels result in changes in mood and energy; but new research now shows that sugar-rich as well as fat-rich foods actually override the hormonal and neural signals responsible for our feelings of satiation and satiety that lead to overeating. These food sources also stimulate our desire to eat and the types of food we prefer (Sclafani, 2013). And while it is well known that negative feelings trigger the desire to eat, research now shows that positive emotions also trigger unhealthy food intake (Evers, Adriaanse, de Ridder, & de Witt Huberts, 2013).

Our daily dietary choices can and do alter concentrations of neurotransmitters in our brain and blood (plasma), impacting their synthesis and release. A good example involves serotonin. Low levels of this neurotransmitter are associated with depression and anxiety. Although 90% is produced in our gut, its synthesis in the brain is bound by the availability of its precursor, tryptophan (a nonessential amino acid), which alters neural processing in mood regulating neurocircuits (Kroes, van Wingen, Wittwer, Mohajeri, Kloek, & Fernandez, 2014). Ingesting a carbohydrate-rich (and protein-poor diet) increases brain levels of tryptophan, which triggers an increase in serotonin production. Although the carbohydrates themselves do not contain tryptophan, the food intake triggers insulin secretion, which in turn "decreases plasma levels of large neutral

amino acids that would ordinarily compete with tryptophan for transport across the blood-brain barrier. Resulting brain changes in serotonin provide a plausible mechanism whereby diet affects behavior" (Spring, 1984). But reaching for a handful of crackers is not the answer. You need to consider homeostatic balance—low or high levels of neurotransmitters and/or hormones result in physiological and behavioral changes. For example, low levels of norepinephrine are associated with loss of interest, poor memory, depression, and ADHD, while high levels are associated with anxiety disorders, an increased sense of arousal, panic attacks, and appetite suppression. Dopamine causes a natural high while low levels lead to loss of energy. But balancing dopamine, serotonin, and norepinephrine is not enough according to Dr. Merrily Kuhn (a naturopathic physician with doctorates in physiology, naturopathic medicine, and holistic medicine). You also need a consider glutamate (AA) and acetylocholine (ACH) and how they interact with the other neurotransmitters.

"Your clients come in with foggy thinking, short term memory issues. They can't concentrate; they're depressed, anxious, hyperactive. They have ADHD, ADD, chronic pain, chronic sinusitis, seizures. This probably describes most of the patients we see," Kuhn says. "Doctors order anti-depressants, which probably do not work because it is a gut issue. Most, if not all, of these complaints are caused by a leaky gut (*the gut wall is damaged so that toxins leak into the vascular system and travel to the brain*). A leaky gut causes a leaky brain. Leaky brain symptoms include: memory loss, foggy thinking, depression, anxiety, chronic pain, poor short-term memory, difficulty concentrating irritability, hyperactivity, achy all over feeling, ADHD, seizures, and chronic sinusitis. It all comes down to the gut. You can throw drugs at the brain, but if the gut is not healthy, those drugs have little likelihood of being effective. A vast number of doctors still think leaky gut is still not an approved medical diagnosis. It's difficult to test for, but now there's one test (an Intestinal Permeability test) that can diagnose leaky gut. Until that was developed, it was diagnosed via symptomology. It's easier for the doctor to say you're depressed go see a therapist."

According to Kuhn, health care professionals, including psychotherapists, need to take a "gut history", which begins with asking questions such as, what do you eat, but also includes asking about clients' stools. "Does it float? Sink? What letter of the alphabet does it represent? If it's a period, you're in trouble; if it's an S-shaped stool, that's great," Kuhn says. "It needs to fill the bowl. If you constantly have a small stool, you have to wonder what's happening to the food and toxins you are eating?"

"But, who's going to talk about this?" Kuhn says.

"No one," she replies. "But it's important. Where are the food and toxins going?"

An initial place to start, Kuhn says, is to have clients keep a detailed food journal for three to four days noting everything eaten (when, what, and the amount), so you have a better handle on what's going on. But if someone writes down she ate macaroni and cheese, you have to ask, was it homemade or Kraft? You want to look at what toxins they're exposed to as well as genetically modified and hybrid foods. The most common foods and drinks associated with adverse reactions include: wheat, sugar, caffeine, dairy, artificial additives, and hydrogenated fats. Furthermore, adverse food reactions in the prenatal and postnatal

It all comes down to the gut. You can throw drugs at the brain, but if the gut is not healthy, those drugs have little likelihood of being effective.

phases of development are now thought to be related to attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) (de Theije, Bavelaar, Lopes da Silva, Korte, Olivier, Garssen, & Kraneveld, 2013).

Dietary supplements are also important to track. Much information is available on the role vitamins and minerals play in our diet. Associations have been demonstrated between low levels of certain B vitamins and schizophrenia, between low levels of zinc with eating disorders, and between low levels of Omega 3 fatty acids with depression. Diets deficient in magnesium or high in glycemic load may lead to higher plasma C-reactive proteins (a marker of low grade inflammation), which is thought to facilitate the development of depression, while oxidative stress, which is thought to induce neuronal damage and modulates intracellular signaling, has been associated with bipolar disorder, depression, autism and schizophrenia (McMartin et al., 2013).

"You need to ask why they're taking these supplements. Did a friend tell them about it? Was it recommended by a health care professional? What brand are they taking and what dose? The average practitioner has no idea about good quality supplements," Kuhn says. "They need to go to Consumerlab.com. Consumer lab tests the quality of supplements. If it's a good quality great; if not, why waste your money? Some supplements are even lacking the ingredients listed on their label."

Furthermore, supplements just don't cut it if you continue to put all the toxins in your system. "Toxins do cross the brain barrier," Kuhn says. "Neurotoxins cause inflammation in the brain, and if the brain is inflamed, all of its functions are going to be different—as a whole the brain is not thinking properly, not making hormones properly."

"It takes a lot of work for practitioners, but it is worth it," Kuhn says, adding that changes in diet have shown improvements in mood swings, anxiety, panic attacks, food cravings and addictions, depression, irritable or aggressive feelings, concentration, memory difficulties, premenstrual syndrome, obsessive compulsive feelings, eating disorders, psychotic episodes, insomnia, fatigue, behavioral and learning disorders, and seasonal affective disorders.

What's at the heart of our gut? The microbiota-gut-brain axis

Our body is constantly communicating with itself. For instance, we have constant bi-directional communication between the gut-brain axis and our central nervous system through neural, endocrine, and immunological pathways that influence brain function and behavior – they play a role in the regulation of anxiety, mood, cognition and pain (Cryan & Dinan, 2012; Louis & Flint, 2013; Stilling, Dinan, & Cryan, 2014).

"One hundred trillion bacteria constitute the human gut microbiota with 1800 genera and up to 40,000 species of bacteria, which possess 100 times the number of genes in the human genome" (Forsythe &

Kunze, 2013, p. 33).

The composition of our gut microbiota is individualized, although we share some common bacteria. It influences our normal physiology and contributes to our diseases, from stress related disorders (depression, anxiety, IBS) to neurodevelopmental disorders (ASD), food regulation, behavior and mood. It impacts our immune, nervous and endocrine systems (Cryan & Dinan, 2012; Louise, & Flint, 2013; Stilling, Dinan & Cryan, 2014).

According to Linus Pauling (Nobel Prize winner in chemistry), the human brain is more sensitive than any other organ to nutritional deficiencies or imbalances. Dysfunctions in any part of the microbiota-gut-brain communication system result in pathophysiological consequences. For example, "chronic stress alters gut microbiota composition; it disrupts the intestinal barrier making it leaky, which increases circulating levels of immunomodulates" (Cryan & Dinan, 2013, p. 704). Because alterations in our diet can result in marked shifts in out gut microbial populations and dietary changes influence behavior, modulation of our gut microbiota may offer a possible intervention for complex central nervous system disorders" (Cryan & Dinan, 2013; Forsythe & Kunze, 2013, p. 60).

Food for Healing:
Is it really that simple?

It's true that dietary changes trigger chemistry and physiological changes within the brain that alter our behaviors and emotions. But is it enough to know which foods increase and decrease the levels of the neurotransmitters, hormones, vitamins, minerals, and essential amino acids responsible for these changes?

Research has shown that tyrosine increases the synthesis of dopamine and norepinephrine, and it has been proven effective in fighting stress, and improving mood and cognitive performance especially in sleep deprived people (Luckose, Pandey, & Radhakrishna, 2013). So do we simply have our clients avoid sugar, saturated fats, cholesterol, and refined foods that are known to decrease dopamine while eating more protein, almonds, bananas, dairy, lima beans, and pumpkin and sesame seeds to increase their tyrosine?

Depressed? Buy foods high in Omega 3 fatty acids (fish, ground flaxseed, hemp, or avocado oils) Stressed? B vitamins aid our adrenal glands in producing adrenalin, which controls the fight or flight response and helps to create serotonin so eat leafy greens, seeds, fish, poultry, and meat. Magnesium is depleted when we're stressed so add green leafy vegetables and pumpkin seeds to the list.

Do we seriously send out clients out with shopping lists that no longer represent the foods they like and want to eat but rather account for their effect on our physiology?

What's Really in the Food We Eat

The probiotic *lactobacillus species* can strengthen the intestinal wall and prevent leaky gut. Clinical evidence supports the role of probiotic interventions in reducing anxiety, decreasing stress responses, and improving mood in people with irritable bowel syndrome and chronic fatigue (Cryan & Dinan, 2013). Do we send our clients packing for yogurt?

Sure, yogurt is a great source for probiotics, but Dr. Kuhn says to make sure it is yogurt. "There should be 3 ingredients in your yogurt: milk and *Lactobacillus bulgaricus* and *Streptococcus thermophilus* to be true yogurt. Nancy's Organic Probiotic Greek Yogurts from Eugene, Oregon have these two and five others probiotic bacteria (*L. acidophilus, L. Casei, L. rhamnosus, and B. bifidum*). You want as many probiotics as possible," she says. She also recommends you always buy plain yogurt, and stay away from fruited yogurts because of the sugars, flavorings, and colors that are added.

"The bottom line is our very poor, manufactured food supply," Kuhn says. "We all eat the same 'stuff' from the grocery stores. All manufactures are feeding us the same food— 50 to 70% of our population are eating white, fast, processed foods. If you go to the store and buy processed bread, there's hair in it. *L-cysteine* (a non-essential amino acid) is a common ingredient in bread (*it's added to the dough to speed up processing, add texture, and improve shelf life*). Human hair is a cheap source (*hair is dissolved and L-cysteine is isolated through a chemical process*). They also add in potassium bromate, a known carcinogen, because it strengthens the dough and allows bread to be more airy (*it causes the formation of tiny, thin-walled bubbles as the bread rises*). There's are also many chemical preservatives and stabilizers in processed foods."

Do we seriously send out clients out with shopping lists that no longer represent the foods they like and want to eat but rather account for their effect on our physiology?

"We need to encourage our clients to eat foods that do not have MSG, high fructose corn syrup, saccharine, or sugar alcohols. And what about added colors, dyes, and flavors? You have to stop and think, what's the manufacturer covering up? What's being changed? All artificial colors, dyes, and flavors are made from petroleum—motor oil. Would you go out of your way to eat motor oil?" Kuhn says.

"Would you drink flame retardant?" she adds.

Sodas and sports drinks, such as Pepsi, Mountain Dew, and Gatorade, contain synthetic brominated vegetable oil (BVO) to keep the citrus flavoring from separating out. It's banned as a food additive in Europe and Japan but not the U.S. It contains bromine, an element found in brominated flame retardants. It does build up in the body and has been associated with memory loss and skin and nerve problems. According to Kuhn, the makers of Gatorade made a public statement that they were thinking about reformulating their product.

"Food is one of the most important things to look at. If your diet is healthy, chances are you will be healthy. If your diet is not healthy, you will have issues. If you need to change, make a change for life," Kuhn says.

Yet it's difficult to convince people to make a total life change. Our clients have eaten the same way their entire life, but to address their mental, emotional, and physical health concerns, the gut must be considered. Kuhn recommends eating as much organic foods as possible (as much as you can afford). But make sure it's labeled '100% organic', she says, otherwise it may still contain pesticides, synthetic ingredients, and genetically modified/engineered foods. She also recommends shopping the perimeter of the grocery store.

"For the first month, I just suggest they don't shop in the middle of the store," Kuhn says to ease clients into the change. "I say, don't buy any food in a box or can and see how it goes. Since the 1950s cans are lined with BPA, a known carcinogen. The FDA is just thinking about doing something. Avoid any processed foods. Have clients make homemade

soup, freeze it in portions, so they can have it easily at hand. Most prepared cereals are a no! Make your own fresh oatmeal or experiment with some of the new grains (quinoa, farro). Wheat berries cook in 15 minutes and are great for your morning cereal. It is excellent to eat cold with fresh fruit."

"Eat more fresh fruits and vegetables. Buy fresh, buy raw, and make it yourself. It takes time, but it's healthier," she says, then adds that it's easy to say eat local when you live in California, but if you're living in climates with artic temperatures, if you don't have access to gardens or greenhouses to grown your own food then you are dependent on our food supply. "We can only change," she says, "if the health of our food supply changes, too."

Merrily A. Kuhn, PhD, ND, PhD, RN has over 40 years of experience in the field of education and critical care nursing. She is currently Education Director at Educational Services. She was certified as a medical-surgical nurse by the American Nurses Association for 20 years and was certified as a CCRN for 18 years. She has presented over 3200 continuing education programs across the country and in 2013 taught over 19,000 health care professionals around the county.

She has authored more than 60 journal articles and has served on the Editorial Board of *Critical Care Nurse,* authoring a monthly column - *CCRN Challenge*. She is the author of twelve books, including *Pharmacotherapeutics: A Nursing Process Approach*, 4th edition, *Manual of IV Drugs,* 2nd edition, *Manual of Critical Care Nursing, Complementary Therapies for the Health Care Provider, Herbal Therapy & Supplements, A Scientific & Traditional Approach, 2nd edition, and Lab reference pocket guide.*

Dr. Kuhn is a member of Sigma Theta Tau and is listed in *Who's Who in American Women*. She holds a B.S. from D'Youville College, a M.S. in education and counseling from Canisius College, a M.S.N. and Ph.D. (physiology) from the S.U.N.Y. at Buffalo, and an ND (Naturopathic Doctor) and PhD (Holistic Health) from Clayton College. Dr. Kuhn retired as a full professor from Lourdes University in Ohio. She continues to teach online at several colleges and universities around the country teaching pharmacology, Pathophysiology and Complementary Therapies.

Dr. Merrily Kuhn
EduServices
6748 Boston State Road
Hamburg, NY 14075
Office 716 649-1350 Cell 716 491 9558
merrily-edsers@verizon.net
www. DrMerrily.org

References

de Theije, C. G., Bavelaar, B. M., Korte, S. M., Olivier, B., Garssen, J., & Kraneveld, A. D. (2013). Food allergy and food-based therapies in neurodevelopment disorders. *Pediatric Allergy and Immunology: Official Publication of the European Society of Pediatric Allergy and Immunology*.

Cryan, J. F & Dinan, T. G. (2012). Mind-altering microorganisms: The impact of the gut microbiota on brain and behavior. *Nature Reviews, 13*, 701-710.

Continued on page 110