2013 (First Half):
Nutrition & the Mind Research Roundup

LOS ANGELES—The first half of 2013 has been another fertile period for nutrition/mind science. New research appeared documenting:

- The role of the human microbiome in supporting mental health. The microbiome is a rich community of bacteria and viruses that co-exists with us within our bodies, outnumbering the human cells within us by 10 to 1.
- How disordered immune systems create inflammation undermining brain function, contributing to mental health disorders like autism, depression, mood disorders and schizophrenia. Allergies and pro-inflammatory foods disturb immune function.
- Studies appeared supporting the role of micronutrient formulas in reducing aggression, anxiety, depression, other mild psychiatric symptoms and more.

Here’s the highlights:

**Intestinal Health May Be More Important To Mental Health Than We Thought.** One of the more intriguing discoveries of recent years has been complex nerve linkages between the intestines and the brain.

Bonaz and Bernstein\(^1\) explained how intimately connected the central nervous system and its neuroendocrine control mechanisms are with gastro-intestinal health. Ohland, Kish et al\(^2\) showed that western-style diets produce weight gain, immune-driven inflammation and anxiety in mice, and that probiotics, supplements that restore the natural gut microbiome, reduced anxiety-driven behavior.

Bested, Logan and Selhub\(^3,4,5\) published a three-part series in *Gut Pathogens* that examines these issues in depth. The original papers are available online for free. Part I covers the early history of the field and the controversial concept of "auto-intoxication" that emerged in the early 20th century as an explanation for mental illness.
Part II takes a look at contemporary research detailing *leaky gut syndrome* and mental health. *Leaky Gut* is a condition in which food allergies increase the permeability of the intestinal wall in ways that increase inflammation throughout the body and brain. Part III explores the progress of research to date and the development of ideas explaining how the health of the gut's microbiome can influence behavior, cognition and mood.

If these observations and theories are correct, modern industrialized diets and widespread antibiotic use may be having a profoundly destabilizing effect on cognition and mental health throughout the world.

The inflammation and malnutrition set in motion by unhealthy gut flora and fauna may be contributing to growing epidemics of depression, anxiety, diabetes, obesity, Alzheimer's, autism, cardiovascular disease and more.

Last year *The Economist* magazine published a very user-friendly introduction to the concept of the microbiome and a brief video introduction.

More on Inflammation and Mental Health. New studies have appeared documenting the effects that allergic and other forms of inflammation appear to be having on emotional and cognitive well-being. Theoharides published a paper detailing how disordered mast cells, immune cells that play important pro-inflammatory roles in damage repair and allergic reactions, are found in abundance in areas of the brain that control stress, behavior and language. He suggests that disordered mast cells may be a factor in autism.

Miller, Haroun et al filed a report on their work at Emory University detailing how poorly regulated cytokines (immunotransmitters involved in allergies and the body's response to infection) impact neurotransmitters such as dopamine, serotonin and more. By upsetting the delicate balance of these mood-regulating substances, disordered cytokines can set the stage for lethargy, depression and irritability. Cytokines create irritability and lethargy when a flu is taking hold.

Couch, Martin et al explained how inflammation interferes with serotonin. (Serotonin is the relaxing, feel-good neurotransmitter drugs like Paxil and Zoloft boost.) Frye, Delatorre et al weighed in with a study showing how oxidative stress (a technical term for inflammation) makes it harder for cells to generate energy, how this contributes to autism and how nutritional supplements and medication can address this issue.

Bulut, Selek et al demonstrated higher levels of fatty (lipid) oxidation in ADHD as well as lower levels of two enzymes that fight inflammation. And Felger, Mun et al showed that pro-inflammatory molecules (cytokines) inhibited the primate brain's dopamine reward pathways, producing symptoms of apathy and depression.
Microglial cells are involved in responding to inflammation and immune challenges in the brain. Frick, Williams and Pittenger\textsuperscript{14} at Yale University contributed a paper detailing how problems with the microglia are associated with major depression, schizophrenia, autism, obsessive-compulsive disorder, and Tourette syndrome. Parihar, Hattiangady, Shuai and Shetty\textsuperscript{15} linked mild inflammation and stress to neuronal degeneration and the depression, anxiety, learning and memory issues characterizing Gulf War Illness.

Raison and Miller\textsuperscript{16} of the University of Arizona published a paper connecting our species' tendency to become inflamed with an evolutionary imperative to combat pathogens. Now that we have access to antibiotics and modern food, the authors claim, the same inflammatory mechanisms that served us so well in primitive times have turned against us. Depression, anxiety and other psychological issues result. The same team\textsuperscript{17} also explained why genes mediating immune-stimulated social withdrawal and anxiety seem to have thrived and spread so widely, implying that they confer some sort of survival advantage.

Briefly Noted. Nutrition interventions relying on a matrix of nutrients produce measurable improvements in stress, anti-social disorders, depression and autism. These interventions are difficult to test to the highest scientific standards for technical and economic reasons,\textsuperscript{18} allowing some observers to claim the evidence of their effects is weak. Even so, omega-3, vitamin and mineral supplements were shown by Long and Benton\textsuperscript{19} to improve the mood and decrease the aggressiveness and impulsiveness of young men. The same team published\textsuperscript{20} a meta-analysis documenting that vitamin and mineral supplements reduce anxiety, stress and mild psychiatric symptoms in nonclinical populations.

Sylvia, Peters et al\textsuperscript{21} reviewed evidence supporting the use of omega-3 EFAs, B vitamins and trace minerals for bipolar disorder. Zhang, Ding et al\textsuperscript{22} linked thiamine status and depression among older Chinese adults. Fernstrom, Langham et al\textsuperscript{23} showed that humans ingesting tryptophan-rich foods produce more depression-lifting serotonin.

Tyagi, Agrawal et al\textsuperscript{24} demonstrated that an EFA-rich diet in youth produces a brain more resilient to stress and trauma in adulthood. Bell and Schwartz\textsuperscript{25} continued their work developing a nanoparticle theory to explain the mechanism of action of extremely dilute homeopathic medicines. And Stonehouse, Conlon et al\textsuperscript{26} showed that omega-3 DHA improved both memory and reaction time in healthy young adults.

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"Before Meds After Meds: Complementary and Alternative Medicine for Anxiety & Depression" (ISBN # 978-0-615-50970-9) can be purchased for $16.95 by visiting the author's website: www.naturalstresscare.org. The ebook can be purchased on Amazon or Barnes and Noble for $4.99

Review copies are available upon request. Please email your interest to media@naturalstresscare.org.

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