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Nutritional psychiatry: Your brain on food

POSTED NOVEMBER 16, 2015, 9:00 AM , UPDATED APRIL 05, 2018, 4:01 PM



[Eva Selhub MD](#)

Contributing Editor

Think about it. Your brain is always “on.” It takes care of your thoughts and movements, your breathing and heartbeat, your senses — it works hard 24/7, even while you’re asleep. This means your brain requires a constant supply of fuel. That “fuel” comes from the foods you eat — and what’s in that fuel makes all the difference. Put simply, what you eat directly affects the structure and function of your brain and, ultimately, your mood.

Like an expensive car, your brain functions best when it gets only premium fuel. Eating high-quality foods that contain lots of vitamins, minerals, and antioxidants nourishes the brain and protects it from oxidative stress — the “waste” (free radicals) produced when the body uses oxygen, which can damage cells.

Unfortunately, just like an expensive car, your brain can be damaged if you ingest anything other than premium fuel. If substances from “low-premium” fuel (such as what you get from processed or refined foods) get to the brain, it has little ability to get rid of them. Diets high in refined sugars, for example, are harmful to the brain. In addition to worsening your body’s regulation of insulin, they also promote inflammation and oxidative stress. Multiple studies have found a correlation between a diet high in refined sugars and impaired brain function — and even a worsening of symptoms of mood disorders, such as depression.

It makes sense. If your brain is deprived of good-quality nutrition, or if free radicals or damaging inflammatory cells are circulating within the brain’s enclosed space, further contributing to brain tissue injury, consequences are to be expected. What’s interesting is that for many years, the medical field did not fully acknowledge the connection between mood and food.

Today, fortunately, the burgeoning field of nutritional psychiatry is finding there are many consequences and correlations between not only what you eat, how you feel, and how you ultimately behave, but also the kinds of bacteria that live in your gut.

How the foods you eat affect how you feel

Serotonin is a neurotransmitter that helps regulate sleep and appetite, mediate moods, and inhibit pain. Since about 95% of your serotonin is produced in your gastrointestinal tract, and your gastrointestinal tract is lined with a hundred million nerve cells, or neurons, it makes sense that the inner workings of your digestive system don't just help you digest food, but also guide your emotions. What's more, the function of these neurons — and the production of neurotransmitters like serotonin — is highly influenced by the billions of “good” bacteria that make up your intestinal microbiome. These bacteria play an essential role in your health. They protect the lining of your intestines and ensure they provide a strong barrier against toxins and “bad” bacteria; they limit inflammation; they improve how well you absorb nutrients from your food; and they activate neural pathways that travel directly between the gut and the brain.

Studies have shown that when people take probiotics (supplements containing the good bacteria), their anxiety levels, perception of stress, and mental outlook improve, compared with people who did not take probiotics. Other studies have compared “traditional” diets, like the Mediterranean diet and the traditional Japanese diet, to a typical “Western” diet and have shown that the risk of depression is 25% to 35% lower in those who eat a traditional diet. Scientists account for this difference because these traditional diets tend to be high in vegetables, fruits, unprocessed grains, and fish and seafood, and to contain only modest amounts of lean meats and dairy. They are also void of processed and refined foods and sugars, which are staples of the “Western” dietary pattern. In addition, many of these unprocessed foods are fermented, and therefore act as natural probiotics. Fermentation uses bacteria and yeast to convert sugar in food to carbon dioxide, alcohol, and lactic acid. It is used to protect food from spoiling and can add a pleasant taste and texture.

This may sound implausible to you, but the notion that good bacteria not only influence what your gut digests and absorbs, but that they also affect the degree of inflammation throughout your body, as well as your mood and energy level, is gaining traction among researchers. The results so far have been quite amazing.

What does this mean for you?

Start paying attention to how eating different foods makes you feel — not just in the moment, but the next day. Try eating a “clean” diet for two to three weeks — that means cutting out all processed foods and sugar. Add fermented foods like kimchi, miso, sauerkraut, pickles, or kombucha. You also might want

to try going dairy-free — and some people even feel that they feel better when their diets are grain-free. See how you feel. Then slowly introduce foods back into your diet, one by one, and see how you feel.

When my patients “go clean,” they cannot believe how much better they feel both physically and emotionally, and how much worse they then feel when they reintroduce the foods that are known to enhance inflammation. Give it a try!

For more information on this topic, please see: Nutritional medicine as mainstream in psychiatry, Sarris J, et al. Lancet Psychiatry. 2015

The field of Nutritional Psychiatry is relatively new, however there are observational data regarding the association between diet quality and mental health across countries, cultures and age groups – depression in particular. Here are links to some systematic reviews and meta-analyses:

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There are also now two interventions suggesting that dietary improvement can prevent depression:

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<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4050338/>

Diet during early life is also linked to mental health outcomes in children (very important from public health perspective):

<http://www.ncbi.nlm.nih.gov/pubmed/24074470>

<http://www.ncbi.nlm.nih.gov/pubmed/25524365> <http://www.ncbi.nlm.nih.gov/pubmed/23541912>

Extensive animal data show that dietary manipulation affects brain plasticity and there are now data from humans to suggest the same:

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Finally, while there are yet to be published RCTs testing dietary improvement as a treatment strategy for depression, the first of these is underway and results will be published within six months:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636120/>

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COMMENTS

40

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Comments:

POSTED JANUARY 3RD, 2016 AT 8:31 AM

wisc-r zeka testi

Eva is correct and there is extensive evidence behind her contentions. I have posted multiple links to the science below

POSTED DECEMBER 16TH, 2015 AT 10:19 AM

Carol

I have believed, and loudly stated, for a long time that poor nutrition was most probably a leading factor in the mental disease that runs rampant in my family. What I don't understand is how a few of us seem to be exempt. Perhaps genetic testing should be made less expensive and more available to the general population. But, more importantly, how do you propose to make these "healthy alternatives" affordable for people? Our foods are rampant with chemicals, hormones, and ...? Some families can barely afford to subsist, much less pay high prices for the healthier foods. I don't believe that you can even get the seeds to grow your own anymore without them having been genetically modified. I think this article is very informative. The links provided are a great place to start on finding information.

Sometimes we need to first be made aware that this information exists; than search for ourselves the information pertinent to our own situations or lifestyles. Thank you berry much for your article and the links provided to give me further resources to find more info on Fitts subject.

POSTED DECEMBER 3RD, 2015 AT 12:06 AM

Susan Nicholls

At age 55 and on atypical bipolar meds since age 19, I'm pre-disposed to diabetes. The meds are awful for your metabolism, and create brain fog. The bipolar is well controlled now, but after a few years of pre-diabetes, and not doing anything about it, I crossed the line to diabetes with a HGB A1C of 7.5 and FBS of 155 and a weight of 230 in January (up from 145 five years ago), despite walking 3-7 miles daily. Refusing to take yet another med, I went to see a nutritionist who is also a doctor and can write scripts for tests. I wanted to know exactly what my body needed before adding anything to the chemistry that is me.

She performed four tests: vit D, ferritin, the Spectracell, and the Alcat food sensitivities. My vit D was deficient, so we added a supplement, ferritin was off the charts, so I started donating blood, Spectracell showed me exactly what I was deficient in relative to nutrition and aging, so I could get onto only those supplements or precursors I needed for a healthy immune system, (also brewing my own Kombucha for probiotic and polyphenols) and the Alcat showed me precisely what foods cause inflammation in my body.

I went through a lifestyle change with no refined sugar, wheat, or soy and limited dairy (minimal raw, grass fed). Upped the organic vegetables, lowered carbs (limited to legumes and wild rice), no fried foods or processed foods. Coconut oil three times daily, Udo's oil once daily. Added krill oil. No cooking with any oil but coconut or red palm. I eat meat or fish once or twice a day, less than 4 oz. (grass-fed beef, wild caught fish or pastured pork/chicken) Totally eliminated those foods the Alcat showed severe or moderate reaction to, and minimized the ones it showed mild reaction to.

AMAZING results! My psychiatrist and my medical doctor are impressed. My LDLs have come down to 76 from 124. TC down from 201 to 153. My HDLs up to 66 from 56. My Hgb A1C is now 5.6, my FBS is 88, and I've lost...50 pounds in one year. I know I have a ways to go, but I've not felt this good in five years. No mood swings, no depression, no manic episodes. Tranquility, serenity and feeling energized. Increased productivity and the brain fog has lifted.

POSTED DECEMBER 3RD, 2015 AT 11:57 AM

Eva Selhub

That's really wonderful!

POSTED NOVEMBER 28TH, 2015 AT 6:59 AM

Carol Chester

My name is Carol Chester. I have been experimenting with diet since the mid-1970s. Regardless of what evidence is presented, I go by how my body feels after eating. Plant-based foods seem the best for me, combined with daily exercise.

POSTED NOVEMBER 25TH, 2015 AT 8:41 PM

C. Petrovich

I'm 69 years old, and 13 years ago, I became a vegetarian. I was the "junk eater extraordinaire" before going clean! I had to do something about my weight, my food addictions and overeating. I could eat bags of junk snacks washed down with sodas, with no thoughts on what it was doing to my health.

Well I did IT! I lost weight, exercise almost daily and I'm not on any prescription drugs. I quit eating all meat except WILD fish, scallops, occasionally. 98% of my diet is plant based. All the colors of the rainbow, nuts, seeds, beans, and of course fruits and veggies. I do eat an occasional sweet desert, an ice cream once in a while, but never to the extent of what I ate in my "previous life."

May I highly recommend that if you feel and look like crap, then do something about it and change that diet of junk, soda's, and garbage candy. If you want off your meds, then start researching what REAL food can do for you.

POSTED NOVEMBER 28TH, 2015 AT 4:55 PM

Jennifer Morrison

To-C. Petrovich-I tried the veggie thing-and guess what??I became so supersensitive to aromatic hydrocarbons(ie-perfumes-heat from gas furnaces-kitchen cleaners-all phenol based products)This actually caused a severe rise in blood pressure.

My advice is"Before doing the "Wacko"diet thing-eat organic-and also find out by way of allergy testing-what is BEST for your body's metabolism-I'm glad that the diet worked for you-JM

POSTED NOVEMBER 25TH, 2015 AT 5:34 AM

radhia slama

your blogs are extremely helpful

POSTED NOVEMBER 25TH, 2015 AT 5:28 AM

radhia slama

thanks for the really good tips

POSTED NOVEMBER 19TH, 2015 AT 11:17 PM

nml

as a sufferer of the combined depression and food cravings – it doesn't seem any of you point to which causes which to occur at the beginning of its situational occurrence. I am now undergoing the debacle – started 2 days ago – beginning with either the chocolate food craving or the depression – one of the two symptoms causing the other — what caused which one to begin — no one seems to have any help or answers or understanding.

POSTED NOVEMBER 20TH, 2015 AT 9:56 AM

Christine

Do you take any kind off magnesium, or vital. D3?

POSTED NOVEMBER 25TH, 2015 AT 9:10 PM

C. Petrovich

I am 69, female, as I mentioned before and I want to add that my diet not only improved my mental well being, but I was able to (2003) finally get off of prozac. I was depressed about my weight, my needing knee replacements, but I overcome all of these hurdles and continually focused on what my final results will be. I never dreamt that I'd be in the place I am today, so happy with my health, my new job and my family.

In my opinion, the continued use of high quality fish oil, high in DHA, for all these years benefits my brain health as well. I also take at least 2,000 IU's of Vitamin D3 daily, 1,000 mg of Vitamin C, as well. I was surprised to find out low my Vitamin D level was. It is normal now, and I highly recommend that everyone get their Vitamin D checked. Ask for it to be checked. I found out that most PC doctors never check it.

To sum up my lifestyle, EAT a healthy diet, stop eating fast food, junk, and eventually your body will heal.

POSTED NOVEMBER 20TH, 2015 AT 10:12 AM

Eva Selhub

It is challenging to figure out what is causing what, once the cycle has been initiated. I usually have my patients start with an elimination diet (along with therapy with one of the therapists I work with) for 3 to 4 weeks and then slowly reintroduce foods to see if there is a trigger. I also make sure they are on probiotics.

POSTED NOVEMBER 21ST, 2015 AT 1:38 PM

Roxanne

How should probiotics be taken?

POSTED NOVEMBER 19TH, 2015 AT 4:21 PM

Angela Ursery

What's laughable about all the criticism of Dr. Selhub's work not being "scientific enough" is that so much of medical "science" isn't scientific at all—and doctors and researchers are admitting that fact. I refer, of course, to a recent editorial in the Lancet, but other examples abound. Remember when being gay was a psychiatric illness, then—poof (no pun intended)—after some political pressure, it was no longer?

I also wonder how many of the complainers have actually read the research. Oh, that's called contempt prior to investigation. Not very scientific.

POSTED NOVEMBER 18TH, 2015 AT 4:33 AM

Rolf

how many influence have chemical additive in nutrien/food on our health and behaviour ?
greeting rolf

POSTED NOVEMBER 17TH, 2015 AT 10:17 PM

Cory Friedt

Thank you for all of the great info!

POSTED NOVEMBER 17TH, 2015 AT 9:37 PM

Michael

Love the complaints. This is not a medical journal nor academic paper. The article had to get approved by the editor with Harvard-quality standards.

I found some of the story new information and interesting.

POSTED NOVEMBER 17TH, 2015 AT 8:48 PM

Eva Selhub

I believe Felice was trying to make sure these references came to light for all those individuals wanting more science. As per Felice Jackson:

The field of Nutritional Psychiatry is relatively new, however there are now extensive observational data confirming the association between diet quality and mental health across countries, cultures and age groups – depression in particular. Here are links to some systematic reviews and meta-analyses:

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<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4167107/>

There are also now two interventions suggesting that dietary improvement can prevent depression:

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<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4050338/>

Diet during early life is also linked to mental health outcomes in children (very important from public health perspective):

<http://www.ncbi.nlm.nih.gov/pubmed/24074470>

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Extensive animal data show that dietary manipulation affects brain plasticity and there are now data from humans to suggest the same:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4563885/>

Finally, while there are yet to be published RCTs testing dietary improvement as a treatment strategy for depression, the first of these is underway and results will be published within six months:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636120/>

POSTED NOVEMBER 17TH, 2015 AT 7:51 PM

Dr Felice Jacka

I have posted (twice) an extensive list of links to the evidence base, yet the moderators have not posted these as yet. I'm not sure why, as they contain nothing controversial not commercial.

Moderators, please publish my post so that others may read the literature for themselves.

POSTED NOVEMBER 18TH, 2015 AT 8:48 AM

Kristen Rapoza

Hi Dr. Jacka, When comments have links in them they are automatically queued up for approval because majority of the time it's spammers posting irrelevant links. Sorry for the delay in approving the other important references regarding this research!

Kristen R.

Harvard Health Publishing

POSTED NOVEMBER 17TH, 2015 AT 4:19 PM

Felice Jacka

There are extensive data from human observational studies, summarised as per these systematic reviews and meta-analyses:

<http://ajcn.nutrition.org/content/99/1/181.long>

<http://www.ncbi.nlm.nih.gov/pubmed/23720230>

<http://www.ncbi.nlm.nih.gov/pubmed/25208008>

As well as extensive data from animal and human studies highlighting the influence of diet on brain parameters – just one example in humans:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4563885/>

Two new interventions suggesting prevention of depression via dietary improvement:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4050338/>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3848350/>

As well as important data suggesting that dietary intakes during pregnancy and early life are relevant for the mental health of children:

<http://www.ncbi.nlm.nih.gov/pubmed/24074470>

<http://www.ncbi.nlm.nih.gov/pubmed/25524365>

<http://www.ncbi.nlm.nih.gov/pubmed/23541912>

The results of the first RCT to investigate dietary improvement as a treatment strategy for major depression will be published within the next six months:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636120/>

POSTED NOVEMBER 17TH, 2015 AT 2:35 PM

Josie

In other interesting articles, there is always at least one, often, references to refereed literature whence I can find more details. W/o those references the article reads very weak. The note at the end of this page explains that the aim of the blog is to provide reliable information.

POSTED NOVEMBER 17TH, 2015 AT 12:27 PM

D

I saw this after having a long discussion about a man in our community who committed suicide yesterday. Given the rise in mental illness, and other chronic illnesses today, do we want to wait – how long – for “enough” scientific evidence that a healthy diet is helpful? Or do we want to work toward promoting healthy diets and lifestyles now, and hope we can use this knowledge and prevent deaths? Are processed, sugar & chemical laden foods so important to health that we can’t use some common sense and the findings we have to start to help people by encouraging healthier foods? Or do more children need to lose their parents to suicide and heroin overdoses while we wait for stronger studies?

POSTED NOVEMBER 17TH, 2015 AT 12:06 PM

Barbara Horutz

Comparing our brains to an expensive car seems inappropriate, we are much more complex than any machine. Food does play a major role in our health and eating good wholesome fruits and vegetables are the key. Growing our own non-GMO food would be ideal with no pesticides and chemical fertilizers. But even then pesticides can blow in from people who use them. because of all these factors, I believe more hands on study should be done to give a concrete solution on this subject.



POSTED NOVEMBER 17TH, 2015 AT 10:08 AM

Eva Selhub MD

For those of you interested in the research:

<http://Www.ncbi.nlm.nih.gov/pubmed/26359904>

In the Lancet Psychiatry

POSTED NOVEMBER 17TH, 2015 AT 10:05 AM

BP

I guess what is bothersome to some readers is that although there is scientific evidence to back up the claims, the claims themselves here are general and vague. ie "There are a lot more cases of diabetes in certain ethnic groups and diabetes can cause multiple systemic health problems that lead to decreased quality of life." (Well known, scientific facts, BUT not specific). VS "Diabetes is most common in Native American/Inuit, African American and Hispanic communities and is the leading cause of kidney failure in the United States.

POSTED NOVEMBER 17TH, 2015 AT 9:50 AM

Peter Ellis

Strongly agree with Jennifer — I'm interested in genuine research news, not a marketing pitch for a point of view I've read many times before.

POSTED NOVEMBER 17TH, 2015 AT 8:18 AM

Maureen

I agree with Jennifer. This article is research lite. Don't dilute the quality of the newsletter.

POSTED NOVEMBER 17TH, 2015 AT 8:17 AM

dia

the only thing i really didnt know is that of probiotics!can you please tell me a brand that is on the market in greece?or maybe i can import it.if not which ingredients are probiotics?thank you very much!

POSTED NOVEMBER 17TH, 2015 AT 3:01 PM

Sara

Hi Dia, I can help you get probiotics in Greece. Contact me by going to [www dot omnivore dot club](http://www.omnivore.club) (yes, that's .club!) and all the way at the bottom there is a like called "Write to us"... That goes directly to me and we can talk details. Best of luck. ~Sara

POSTED NOVEMBER 17TH, 2015 AT 8:14 AM

Amelie Renaud

And best of all, those wonderful anti-oxidants are badly needed to help cancer cells grow and reproduce.

POSTED NOVEMBER 17TH, 2015 AT 5:09 PM

Felice Jacka

Possibly true if you take antioxidants as supplements, but certainly not true if you consume them as food

POSTED NOVEMBER 17TH, 2015 AT 8:12 AM

Jennifer

This article mixes up fact with conjecture in a dubious stew of food topics. It lacks science but includes a “premium” level of generalities. The Gazette is generally a high quality publication – please do not drag it down with supermarket-level blogs.

POSTED NOVEMBER 17TH, 2015 AT 5:07 PM

Felice Jacka

Eva is correct and there is extensive evidence behind her contentions. I have posted multiple links to the science below

POSTED NOVEMBER 17TH, 2015 AT 4:30 AM

jaybehm

I agree with you Eva that food is directly effecting the structure and function of the brain. Thus, we should have to eat healthy food. I like the way, you represent your thoughts. The example given by you is fantastic. Thank you for sharing this knowledgeable post.

POSTED NOVEMBER 16TH, 2015 AT 2:41 PM

M

Given this is a popular line of thought, I would appreciate evidence to back it up.

J

Completely agree.

POSTED NOVEMBER 17TH, 2015 AT 9:30 PM

Dr Felice Jacka

The field of Nutritional Psychiatry is relatively new, however there are now extensive observational data confirming the association between diet quality and mental health across countries, cultures and age groups – depression in particular. Here are links to some systematic reviews and meta-analyses:

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Finally, while there are yet to be published RCTs testing dietary improvement as a treatment strategy for depression, the first of these is underway and results will be published within six months:

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There is much research work to do in this new area, but considering that poor diet is now the leading killer globally and mental disorders account for the largest burden of global disability, the fact that diet appears to play a role in mental as well as physical health (as well as dementia) must be taken very seriously.

POSTED NOVEMBER 17TH, 2015 AT 8:40 AM

Eva Selhub

There are many references within these scientific papers my colleagues and I collaborated on if you are interested:

<http://www.ncbi.nlm.nih.gov/pubmed/24422720>

<http://www.ncbi.nlm.nih.gov/pubmed/23506618>

<http://www.ncbi.nlm.nih.gov/pubmed/23497633>

<http://www.ncbi.nlm.nih.gov/pubmed/23497650>

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