mental wellbeing

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nutrition and mental wellbeing

brain is 2% of body weight but consumes 20% of calories

85 billion neurons in the brain 100 billion in the gut – our second brain

Neurotransmitters and hormones communicate our feelings and emotions

gut-brain axis is just starting to be understood: 95% of serotonin in the gut; GABA produced in pancreas

Gut issues such as IBS have a high comorbidity with anxiety and depression; stress is believed to be a trigger

neuropsychiatry is young but rapidly growing field

where angels fear to tread!

vegan

carnivore

paleo

Low-fat

"It's to help prevent fallen angels."

vegetarian

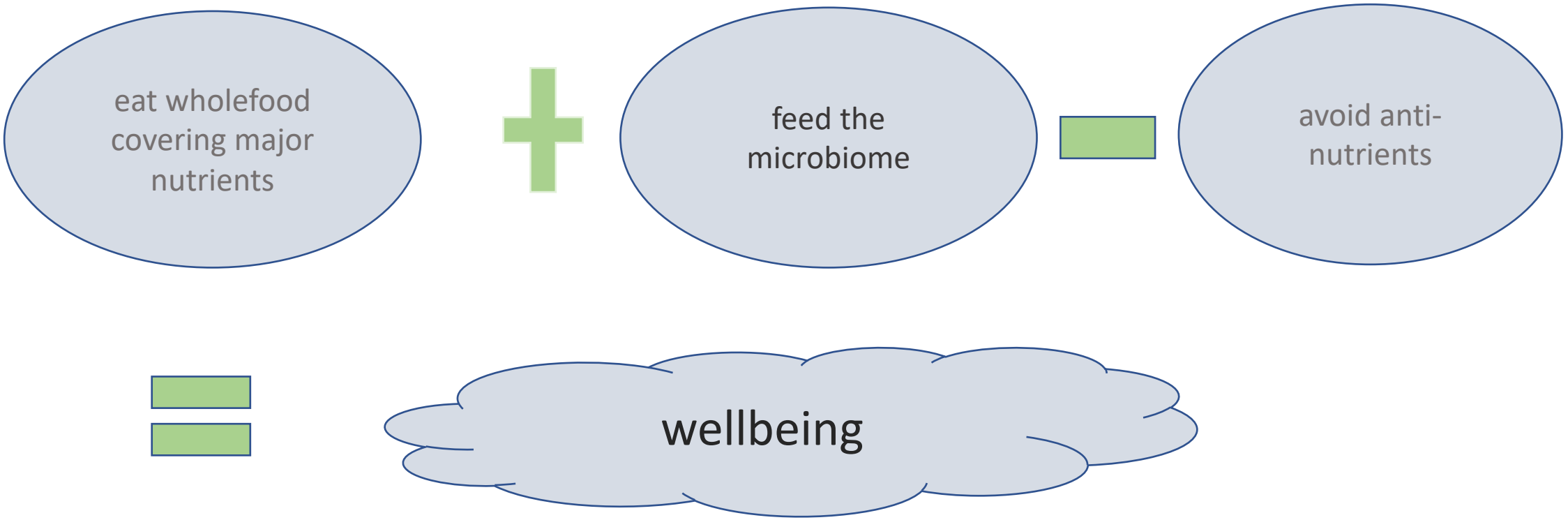
mediterranean

ketogenic

cigarette

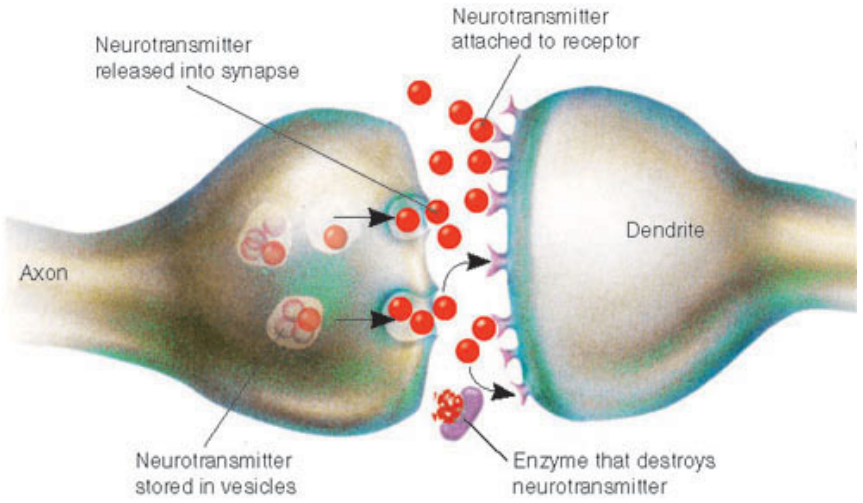
3 key principles

formula for optimising mental health



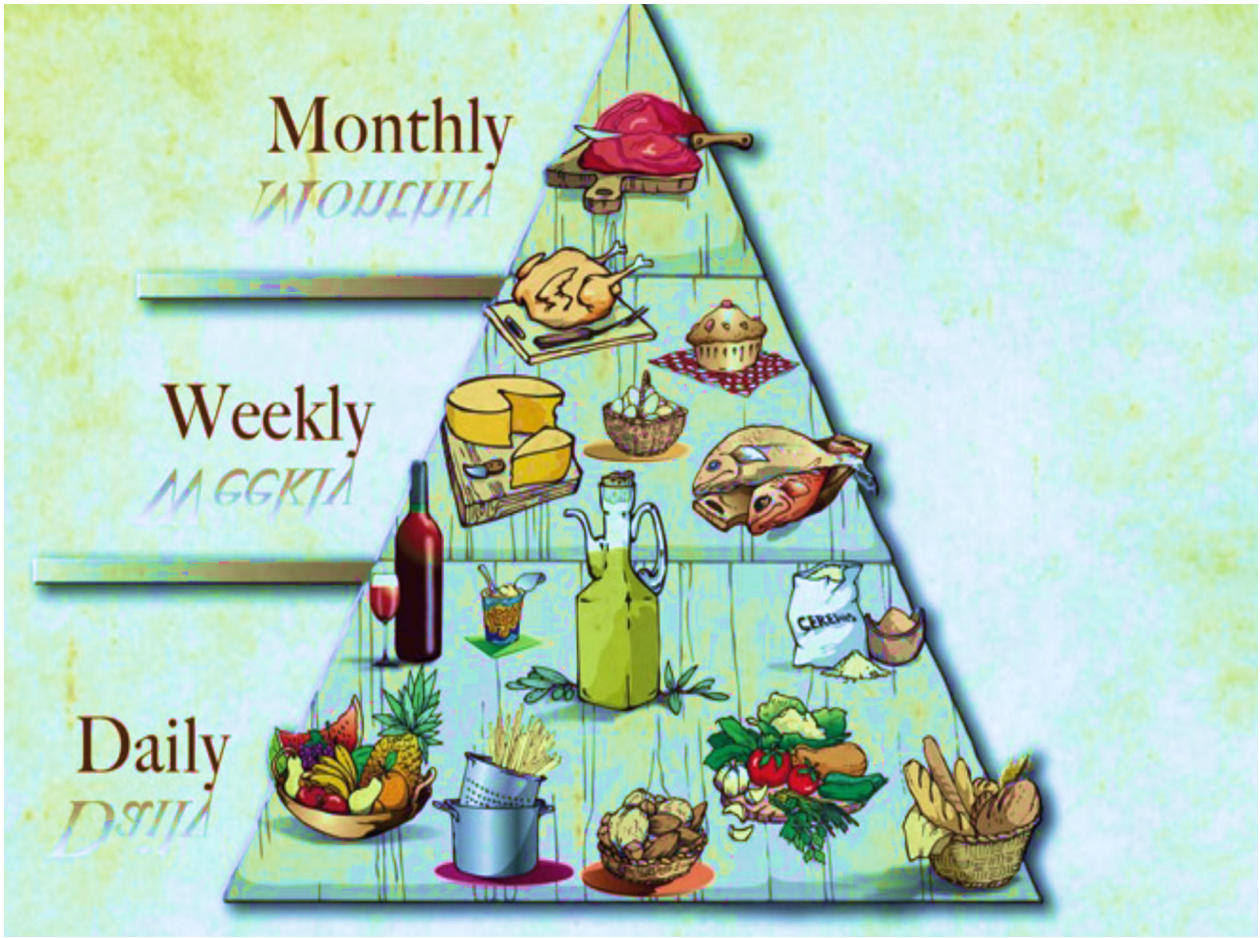
our electrochemical brain

- brain comprises 60% essential fatty acids which determine cell membrane health and brain function
- comprised of neurons approx. 85 billion and 100 billion glial cells
- brain activity is one neuron releasing an electrochemical message (neurotransmitter) from its axon
- neurotransmitter crosses a synapse and finds receptors in dendrites of next neuron – a neural pathway is created
- amino acids derived from proteins are precursors to neurotransmitters
- Neurogenesis and neuroplasticity require neurotransmitters – ability to grow and change through out our life



brain health and structure nutritional building blocks

- associated with protection against neurovascular disease and stress resilience
- mediterranean diet protective against depression - 50% reduction in one study
- more effective than social support for relieving symptoms of depression
- it promotes expression of brain-derived neurotropic factor (BDNF) protein essential for neuroplasticity and neurogenesis
- mediterranean most studied but other whole food diets likely to be effective



21 nutrients – Drew Ramsey MD

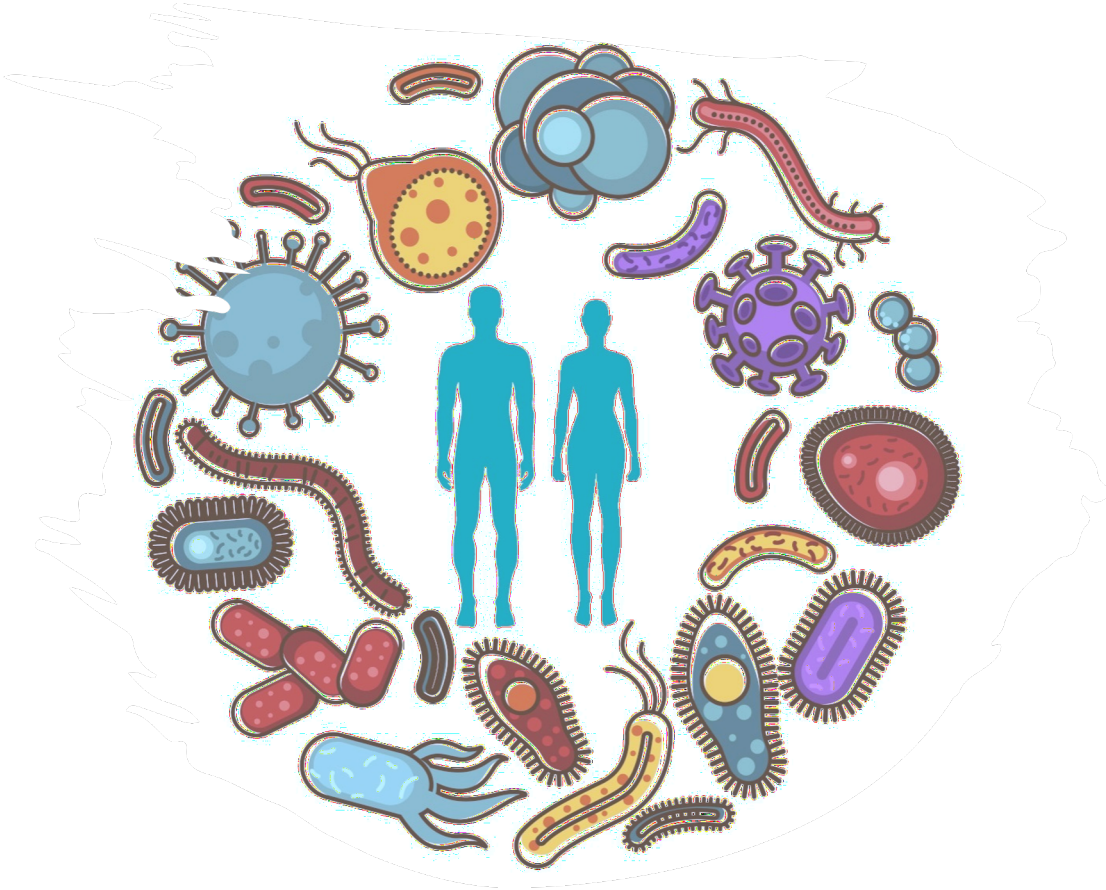
Foundations	Protection	ignition
• Omega-3 fats • Zinc • Vitamin B12 • Magnesium • Vitamin B9 • Microbes probiotics and prebiotics • Whole proteins	• Vitamin E • Vitamin K • Vitamin A and cartenoids • Phytonutrients • Monounsaturated fats • Vitamin D • Selenium	• Iron • Vitamin B1 • Choline • Calcium • Potassium • Iodine • Vitamin C

some specifics

Omega-3	Whole protein	Vitamin B12
building blocks of nerve cells, anti-inflammatory prevent and treat depression Improves cognition in neurovascular disease (dementia) Oily fish (DHA and EPA) Chia and linseeds (ALA)	contain amino acids eg tryptophan, tyrosine, phenylalanine precursors to neurotransmitters ie mood determinants meat and dairy beans and legumes	converts food to energy and prevents brain shrinkage deficiency associated with depression and even psychosis meat and dairy vegans - supplements
magnesium	Vitamin B 9 (folate)	phytonutrients
stimulates BDNF -repair and growth growth and eases anxiety Almonds, beans and leafy greens	myelin (insulating fat on neurons) serotonin, dopamine source of GABA etc chicken liver, legumes, spinach	BDNF and antioxidant properties brain repair and growth eat the rainbow

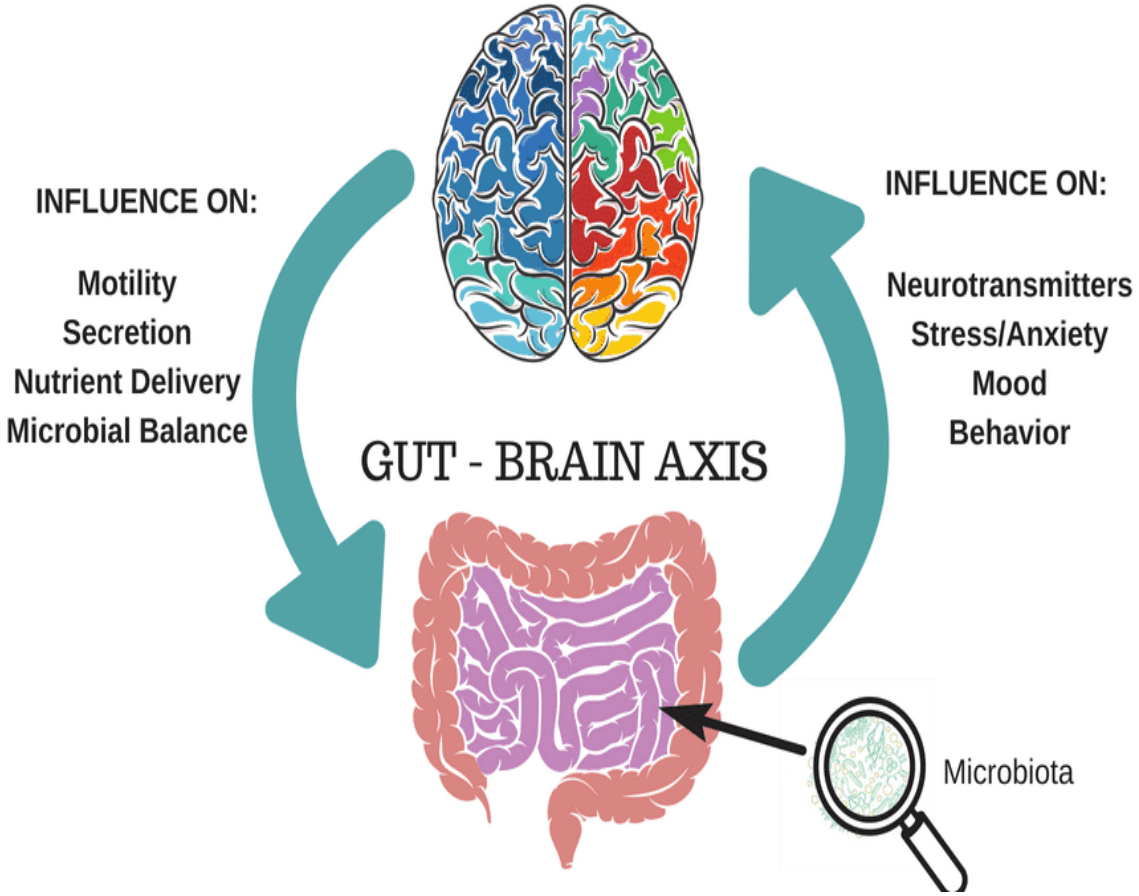
are we human?

- 100 trillion microbes living on and inside us – bacteria, virus, phages and fungi
- as a supra-organism, genetically we are 1% human; and 99% microbial
- the microbiome is sometimes referred to as the forgotten organ
- bad bacteria (pathogens) and good bacteria (commensuals) make up the microbiome
- commensuals not neutral play an active role in keeping us functioning and in optimal physical and mental health
- overgrowth of bad bacteria increases proclivity to anxiety, stress and depression



3 communication channels between gut-brain

- nervous system; immune system and endocrine system
- nervous system has direct link via the vagus nerve – (parasympathetic or calming arm of autonomic nervous system)
- immune system triggers inflammatory response through cytokines – prolonged inflammation increases vulnerability to stress and anxiety
- endocrine system releases hormones in the body – including stress hormones
- Healthy gut
  - dampens inflammation
  - encourages production of BDNF
  - influences our mood through neurotransmitters and hormones



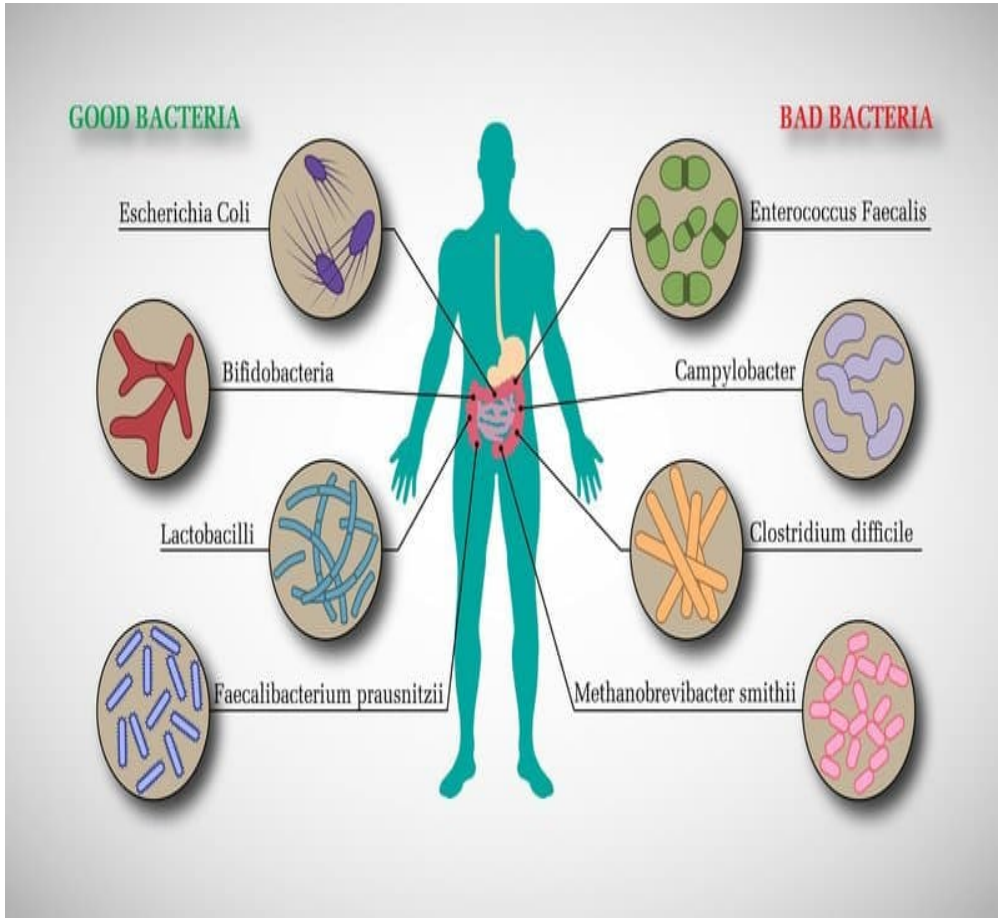
we have between 500 and 1000 species - some transient others have been with us since birth

- commensuals first line of defence against pathogens
- microbes are chemical factories making **vitamins, neurotransmitters and short-chain fatty acids**;

- Up to 30% of the nutrition we absorb from our diet is through microbial metabolic effect

- many commensual microbes metabolise fibre and produce short-chain fatty acids butyrate, lauric acid which promotes neurogenesis and good mood

- Bidifobacterium – several
- Lactobacillis – subspecies



maintaining a healthy gut – increase microbial diversity

prebiotics

- microbes digest insoluble fibre – produce short chain fatty acid
- Prebiotics – inulin rich foods
  - onions
  - chicory root
  - leeks
  - jerusalem artichoke
  - raw banana

Diverse range of vegetables; wholegrains and legumes

probiotics

- Eat a range of fermented food – food contains good bacteria
- Live cultures
  - yoghurt
  - sauerkraut
  - Kefir
  - Kimchi
  - Kombucha
  - Supplements?
- Again diversity is the aim – starting to identify specific bacteria

intermittent fasting

- promotes autophagy
- allows good bacteria to re-populate
- healthy gut lining
- prolonged fasting depletes gut microbiome

What about supplements?

Look to a diet of whole food first and foremost – evidence around supplements conflicting and disparate

- Probiotics: lactobaccilus and bifidobacterial most common but can be transient
- Crapsules: – would you?
- Omega-3 - EPA and DHA; ALA: some studies suggest neuroprotective but quality important
- Vitamin B12 and magnesium ; impact of deficiency recognized particularly stress resilience and anxiety supplements?
- Amino acids – found in proteins and are the precursors to neurotransmitters/hormones = tryptophan is the precursor to serotonin, L-Tyrosine precursor to dopamine ? Over correction?

anti-nutrients

alcohol

- opoid receptors and dopamine unnatural level of increase
- glutamate and dynorphin maintains homeostasis
- toxin which triggers stress response adrenaline and cortisol
- body prioritises metabolising alcohol so reduces nutritional uptake
- B vitamins including vitamin B12 depleted
- Reduces microbial diversity

sugar

- blood sugar rollercoaster exacerbates anxiety
- fatigue and reduce resilience to stress
- addictive dopamine creates cravings – brain imaging shows sugar lights up brain more than cocaine
- inflammation in gut and brain
- gut dysbiosis

Ultra-processed food

- 50% of nutrients derived from ultra-processed food according to BMJ
- malnourishment –excess calories minimal nutrients
- refined carbohydrates same impact as sugar
- reduces gut microbiome diversity
- chemicals not inert

Friend or foe?

resources

SMILEs study – Felice Jacka at Food and Mood Centre, Deakin University

Psychobiotic Revoulution - John Cryan and Ted Dinan

Eat Complete – Drew Ramsey MD

The Diet Myth – Tim Spector

Spoon-Fed – Tim Spector