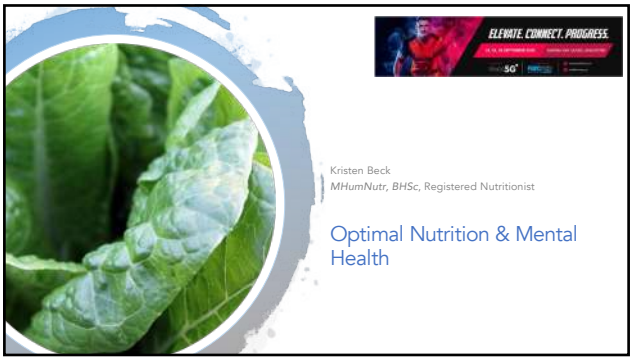


Kristen Beck
MHumNutr, BHSc, Registered Nutritionist

Optimal Nutrition & Mental Health

1

Qualifications & Experience

- Master of Human Nutrition (Deakin University)
- Postgraduate Certificate in Higher Education (Macquarie University)
- Bachelor of Health Science (University of New England)
- Advanced Diploma of Naturopathy

- Director: Beck Health & Nutrition – Nutrition Communications & Education Company
- Lecturer: Nutrition and Sports Science – School of Sports Management ICMS, Manly
- Freelance Media: Channel 9, News.com.au, Channel 7, News.com.au, Women's Health Australia

2

3

Mental Health Issues - Prevalence (pre-COVID-19)

Global Prevalence:

Depression: estimated 264 million (more women than men) (World Health Organization November 2019)

Australian Prevalence:

At some time during their adolescence and adult life, around 7.3 million (or 45% of Australians aged 16–85) will experience a common mental health-related condition such as depression, anxiety or a substance use disorder (Australian Institute of Health & Welfare, 2014).

4

Mental Health Impact of CO-VID19

- Direct - fear of virus
- Financial and family pressure
- Isolation (and lack of activity!)
- some or many have never experienced this level of uncertainty


Asian Journal of Psychiatry

COVID-19 and mental health: A review of the existing literature

Ravi Philip Rajkumar

5

Eat well = feel better (sense of control)
Bi-directional relationship – nutrition & mental health

Source: Jacka 2012

6

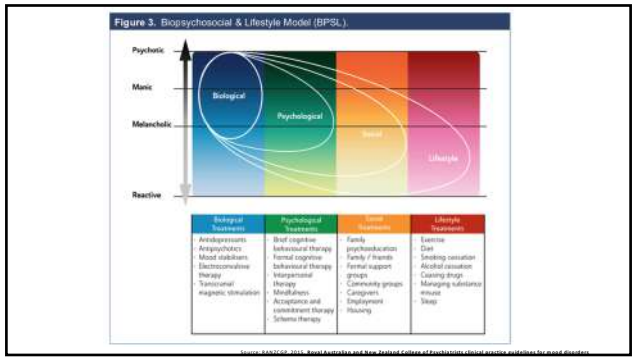


Figure 3. Biopsychosocial & Lifestyle Model (BPSL).
Psychotic
Manic
Melancholic
Reactive
Biological
Psychological
Lifestyle

7

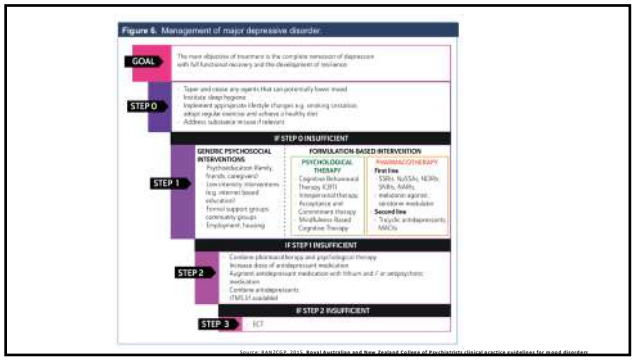
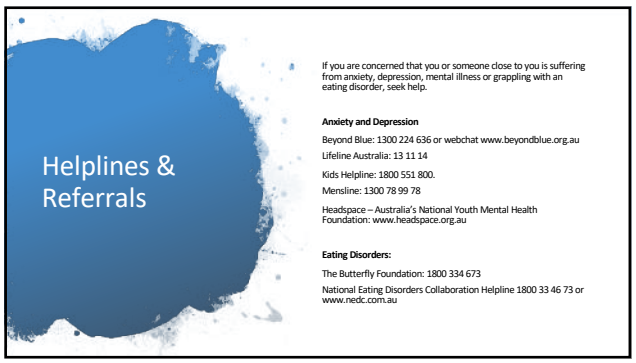


Figure 6. Management of major depressive disorder
GOAL
STEP 0
IF STEP 0 INSUFFICIENT
STEP 1
GENERIC PSYCHOSOCIAL INTERVENTIONS
FORMULATION-BASED INTERVENTION
PSYCHOLOGICAL THERAPY
PHARMACOTHERAPY
First line
Second line
IF STEP 1 INSUFFICIENT
STEP 2
IF STEP 2 INSUFFICIENT
STEP 3
ECT

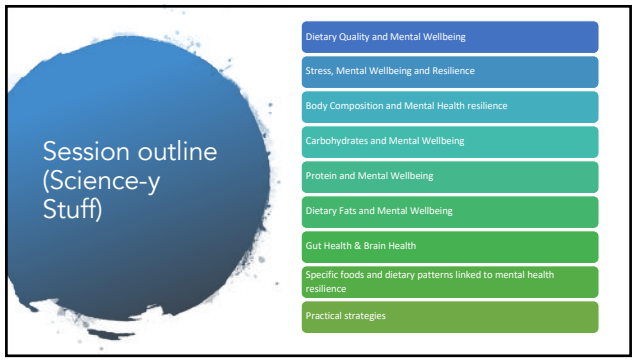
8


You, the exercise professional "lifestyle psychiatry"
Unique, privileged position to work with clients *over time*
More opportunity to build trust, follow up and maintain long-term relationships with clients than other health practitioners (including nutritionists and dietitians).
Most clients ask you about nutrition because:
• 1. They expect that you know
• 2. They like you and they trust you

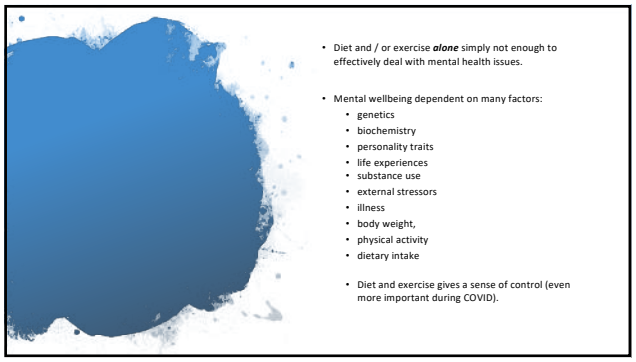
9


Helplines & Referrals
If you are concerned that you or someone close to you is suffering from anxiety, depression, mental illness or grappling with an eating disorder, seek help.
Anxiety and Depression
Beyond Blue: 1300 224 636 or webchat www.beyondblue.org.au
Lifeline Australia: 13 11 14
Kids Helpline: 1800 551 800.
Mensline: 1300 78 99 78
Headspace – Australia's National Youth Mental Health Foundation: www.headspace.org.au
Eating Disorders:
The Butterfly Foundation: 1800 334 673
National Eating Disorders Collaboration Helpline 1800 33 46 73 or www.nedc.com.au

10


Session outline (Science-y Stuff)
Dietary Quality and Mental Wellbeing
Stress, Mental Wellbeing and Resilience
Body Composition and Mental Health resilience
Carbohydrates and Mental Wellbeing
Protein and Mental Wellbeing
Dietary Fats and Mental Wellbeing
Gut Health & Brain Health
Specific foods and dietary patterns linked to mental health resilience
Practical strategies

11


• Diet and / or exercise ***alone*** simply not enough to effectively deal with mental health issues.
• Mental wellbeing dependent on many factors:
• genetics
• biochemistry
• personality traits
• life experiences
• substance use
• external stressors
• illness
• body weight,
• physical activity
• dietary intake
• Diet and exercise gives a sense of control (even more important during COVID).

12

Dietary Quality & Mental Wellbeing

"A diet high in saturated fats and refined sugars has a very potent negative impact on brain proteins that we know are extremely important in depression – neurotrophins, which protect the brain against oxidative stress and promote the growth of new brain cells. There also seems to be an impact of saturated fat on the stress response system, which is also important in both depression and anxiety"

Associate Professor Felice Jacka, President, International Society for Nutritional Psychiatry Research.

http://www.isnpr.org

13

Overarching dietary recommendations for mental health

"Specialised and detailed dietary advice may not be necessary. Recommendations should focus on following national guidelines for healthy eating and physical activity"

Jacka & Berk, 2012, Depression, Diet and Exercise, *Medical Journal of Australia* 2012, Vol. 3. Suppl.4.pp.21-23.

14

What does the research say?

- Meaningful research into link between overall dietary intake (rather than single nutrients) and mental health only started to emerge from around 2009.
- Western diet typically deficient in a number of key nutrients critical for the proper functioning of the central nervous system.

- Why is it so hard to effectively measure dietary intake?

15

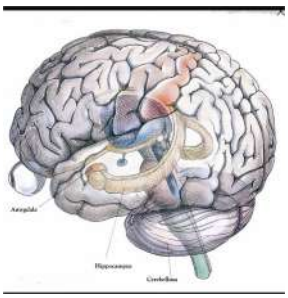
Diet Quality

- Research into diet quality only possible due to better computational / analysis power.
- Diet quality can be assessed via a range of indexes, but is typically characterized by:
  - Vegetables
  - Fruits
  - Wholegrains
  - Fish
  - High quality meat (including grass fed red meat)
- "Traditional diets" vary across cultures yet still appear to be protective against development of mental illness.

16

Research: Western Diet *associated* with smaller hippocampal size

Australian study shows too much junk food can actually shrink your brain. Researchers from Deakin University used MRI scans to measure size of the hippocampus (a part of your brain essential to learning and memory which gets smaller as you age). Animal studies also confirm that poor diet can actually cause the hippocampus to shrink (Jacka, 2015).



17

How diet influences mental health; Likely mechanisms

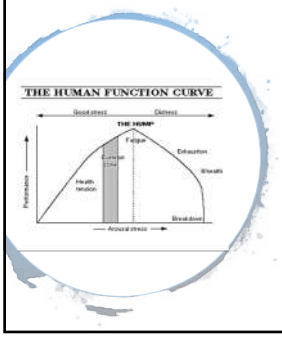
1. Diets based on highly refined, processed foods are typically low in important nutrients – leading to specific nutrient deficiencies that have been proven to be involved in mental health (e.g., B-vitamins, zinc and omega-3 fatty acids).
2. Poor dietary quality is a direct risk factor for body weight gain. Overweight and obesity is strongly associated with common mood disorders including anxiety and depression (AIHW, 2014).
3. Diets based on highly processed foods typically contains excess added sugars, saturated and trans fats - which have been shown to trigger chronic, low-grade inflammation in the body (Berk et al., 2013).

18

Stress

- Stress, on its own, is not a mental disorder. Normal part of everyday life.
- Concept of *stress* - as a factor that can independently impact on health - developed by Hungarian endocrinologist Hans Selye in 1930s. Selye defined stress as: "the non-specific response of the body to any demand for change".
- Selye demonstrated that stress can directly cause development of biological changes in the body and that these biological changes can cause life-threatening illness.
- Short term impact of stress: Selye's research clearly and repeatedly demonstrated that laboratory animals, subjected to acute but different physical and emotional stimuli or stressors (blaring light, deafening noise, extremes of heat or cold, perpetual frustration) developed common pathologic (disease-causing) biological changes including:
  - stomach ulceration
  - shrinkage of lymphoid tissue
  - enlargement of the adrenal glands.
- Long term impact of stress: Selye's later research demonstrated, when exposed to **persistent** or **chronic** stress, laboratory animals far more likely to develop various chronic diseases similar to those seen in humans, including heart attacks, stroke, kidney disease and rheumatoid arthritis.
- Before Selye's research disease and illness was believed to be solely a result of exposure to specific pathogens.

19



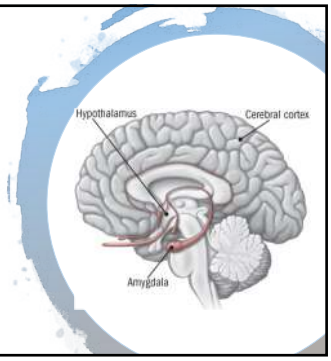
Good Vs. Bad Stress

•Source: Nixon PG, 1982, The human function curve – A paradigm for our times, Act Nerv Super (Praha). 1982;Suppl 3(Pt 1):130-3.

20

Physiology of the stress response

Source: Harvard School of Public Health, 2013



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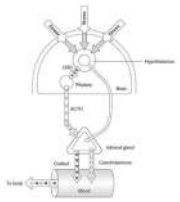
Physiology of the Stress Response



Source: Randall, 2010

22

Hormones & Neurotransmitters involved in stress response

	Function
Hormone	
Cortisol	Helps maintain blood pressure, blood glucose, immune response, anti-inflammatory actions, macronutrient metabolism
Adrenalin	Short term stress (fight or flight response). Increases blood supply to heart and skeletal muscles, increases heart rate and blood pressure, breathing rate, oxygen delivery to brain, enhances sight, hearing and other sensory input, release blood sugar from stores carbohydrates in muscles and liver.
Neurotransmitter	
Serotonin	Inhibitory neurotransmitter (does not stimulate the brain). Stabilizes mood and balances any excessive excitatory (stimulating) neurotransmitter in the brain.
GABA	Inhibitory neurotransmitter – sometimes referred to as nature's "Valium like substance".
Dopamine	Both excitatory and inhibitory – when dopamine levels either elevated or low, mental focus, concentration, motivation and attention span can be impaired.
Noradrenalin	Excitatory neurotransmitter, also helps to make adrenalin. Noradrenalin can cause anxiety at elevated excretion levels as well as some mood-depressing or dampening effects. Low levels of noradrenalin are associated with low energy, impaired mental focus and sleep cycle problems.

23

Inflammation, Immunity and Mental Health

"One of the things we need to stop thinking is that mental illness is just a disorder of the brain".

- You feel depressed when you get sick. One way your immune system fights infection is by causing inflammation. Inflammation is also a key component of the stress response (Harvard School of Public Health, 2013).
- Mounting evidence also indicates that inflammation may play a significant role in the development of mood disorders including depression and anxiety.
- Elevated levels of pro-inflammatory cytokines have been repeatedly demonstrated in both major depressive disorder and bipolar disorder patients (Rosenblat et al, 2014).

24

Inflammation, Immunity and Mental Health

- Extensive body of data showing that depression is associated with
  - chronic low-grade inflammatory activation of the immune system (cell-mediated immunity)
  - activation of compensatory anti-inflammatory reflex system (CIRS) in the body (Berk et al, 2014).
- Research also demonstrates that actually causing inflammation in healthy subjects will lead to development of classical depressive symptoms (Berk et al, 2013).

25

Body composition and mental health

Obesity

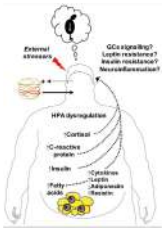
Body fat is a rich source of inflammatory factors including adipokines, chemokines and cytokines.

Bidirectional relationship between obesity and depression

Obesity associated with development of depression, and depression is associated with obesity – reflecting a potential vicious cycle between these two conditions which appears to centre around inflammation.

26

Metabolic signals and disturbances linking obesity and abdominal adiposity with depression



Hormonal changes associated with abdominal obesity include:

Hypothalamic-pituitary-adrenal (HPA) dysregulation (incorrect functioning)

Altered plasma levels of cortisol, leptin and insulin — hormones implicated in the central control of emotion and mood.

Obesity-induced impairments in brain glucocorticoids (GCs)

Central fat accumulation also stimulates the release of inflammatory cytokines (e.g., tumour necrosis factor-α, interleukin-1β) and signals (C-reactive protein) that can promote neuro-inflammatory responses and depressive behaviour.

27

Medications and weight gain

- Remember Scope of Practice
- Be mindful of weight gain with many anti-depressant / anti-anxiety medications

28

Underweight

- Underweight or very low body fat levels can exacerbate stress, anxiety and depression (particularly in females).
- Low body fat interlinked with low oestrogen. Low oestrogen may impact anxiety by not "switching off" fear response after stressful situations subsides (Cover et al., 2014).
- PTSD research demonstrates that mental impact of trauma can be significantly different based on oestrogen level (timing of trauma within menstrual cycle or menopause) (Maddox et al., 2017).
- Oestrogen is not just produced in ovaries, also in adrenal glands (Kenealy et al., 2013).
- Low body temperature (and increased anxiety) may stimulate excessive in females (Maddox et al. 2017).
- In short term - being hungry also increases stress / anxiety (regardless of weight or composition).

29

Carbohydrates and Mental Wellbeing

Short-term / immediate impact

- Carbohydrates affect mood and behaviour both via blood sugar and release of neurotransmitters
- Eating a carbohydrate rich meal triggers release of insulin.
- Insulin allows sugar in blood to enter body cells and also triggers entry of tryptophan (an amino acid) to enter the brain, which impacts on the release of neurotransmitters.
- While our body can use a combination of fat and carbohydrate for fuel, or brains primarily only use carbohydrates.

Longer term dietary carbohydrate choices

- Carbohydrates are essential for optimal mental wellbeing, but the *types* of carbohydrate you choose can significantly affect long term mental wellbeing.

30

Sugars

Sugar impacts health and mental wellbeing in three ways:

1. Drops in blood sugar levels cause lethargy, irritability, tremors, shakiness and mood swings which, which can exacerbate stress, anxiety and depressive states.
2. Extrinsic (added sugars) or "free sugars" have been shown to promote inflammatory response.
3. Displacing healthier, more nutritious foods from the diet, therefore reducing overall dietary quality and potentially leading to nutritional deficiencies.

Australian Dietary Guidelines (2013) recommend limiting intakes of foods and drinks containing added sugars.

The WHO recommends limiting intake of free sugars to <5% of total dietary intake.

31

Fructose and mental health

- Fructose = fruit sugar.
- Numerous studies show links with mental health issues, such as cognitive decline and memory.
- Overwhelming majority of negative health research outcomes based on "non-natural sources of fructose") such as the ingredient high-fructose corn-syrup (HFCS) and / or extracted fructose (Melville, 2014).
- Fructose and HFCS are commonly used as a sweetener in the U.S. food supply not widely used in the Australian food supply (NHMRC, 2013).
- Extensive research suggests fructose intake from non-natural sources impair neuronal (nerve-cell) connections, spatial memory, and other cognitive function. Research also suggests that non-natural sources of fructose, such as sugar-sweetened beverages increase inflammation in the brain and can impair memory consolidation.
- **Fructose, in its natural form in fresh fruit, comes along with water, fibre, vitamins and minerals and does not cause blood sugar spikes or inflammatory responses.**

32

Refined grains Vs. Wholegrains and mental health

- Research shows that refined carbohydrates are amongst the most detrimental foods to mental health (Melville, 2014).
- Refined grains (e.g. white wheat flour used to make white bread and pasta) have had bran and germ layers removed, leading to loss of most of the dietary fibre and many of the vitamins (in particular B-vitamins – that are integral to healthy stress response), minerals (including magnesium and selenium) and phytochemicals (shown to exert potent anti-inflammatory actions).
- In a 2010 study, researchers found that a diet high in refined grains led to a greater concentration of a certain inflammation marker in the blood, while a diet high in whole grains resulted in a lower concentration of two different inflammation markers.

33

Protein and Mental Wellbeing

- Protein and individual amino acids can affect brain functioning and mental health.
- Many neurotransmitters are made from amino acids.
  - Dopamine is made from the amino acid tyrosine
  - Serotonin is made from the amino acid tryptophan.
- Deficiency of either of these amino acids associated with low mood and aggression.
- Dietary protein also plays a role in managing stress and anxiety via a range of mechanisms including:
  - blood sugar balance
  - appetite control

34

Red meat and anxiety

- Research from Deakin University (VIC) suggests eating less than recommended amount of red meat related to depression and anxiety in women.
- Researchers originally thought red meat might not be good for mental health (as studies from other countries had found red meat consumption to be associated with physical health risks) but turns out that it actually may be quite important.
- Women consuming less than recommended amount of red meat found to be twice as likely to have a diagnosed depressive or anxiety disorder as those consuming recommended amount.
- Study also took into account overall healthiness of the women's diets, as well as other factors such as socioeconomic status, physical activity levels, smoking, weight and age.
- Researchers still suggest it's not a good idea to eat too much red meat either and regularly eating more than the recommended amount of red meat was also related to increased depression and anxiety.
- Findings: Overall quality of your diet is important to mental health. But it seems that eating a moderate amount of lean red meat, which is roughly 3-4 small, palm-sized serves a week, may also be important.
- Researchers advise sticking with **grass fed** meats whenever possible. "We know that red meat in Australia is a healthy product as it contains high levels of nutrients, including the omega-3 fatty acids that are important to mental and physical health. This is because cattle and sheep in Australia are largely grass fed. In many other countries, the cattle are kept in feedlots and fed grains, rather than grass. This results in a much less healthy meat with more saturated fat and fewer healthy fats."

35

Dietary Fats and Mental Wellbeing

- 1 gram of fat = 37.7 kJ so diets high in fat may contribute to weight gain and therefore possible mental health impacts.
- Types of fat consumed is the most important factor in relation to mental health.

36

Omega 3 : Omega 6 ratio & inflammatory response

It is likely that human beings evolved on a diet that included a ratio of omega-3 to omega-6 fatty acids of approximately 1 to 1.

Typical western diet, this ratio is on average 15 to 1 omega 6 to omega 3, and can be 25 to 1 omega 6 to omega 3. Western diets are typically very low in omega 3 fatty acids and have excessive amounts of omega 6 fatty acids (Simopoulis, 2002),

A chronic imbalance of omega 6 to omega 3 fatty acids has been identified in numerous studies to be a potential inflammatory trigger and associated with chronic diseases including depression, heart disease, type 2 diabetes and obesity (Hegarty & Parker, 2013).

37

Balancing omega 3:6 ratio

Methods to reduce omega 6 intake (balancing omega 3 to omega 6 ratio):

- Cook with cold-pressed olive oil. Olive oil is low in omega 6 fatty acids and saturated fat. Some other oils that are low in omega 6 and saturated fats and are thus good for cooking are high oleic safflower oil, high oleic sunflower oil and canola oil. Be sure to avoid using any partially hydrogenated oils because they tend to be high in trans fat (see below).
- Avoid peanut oil, soybean oil, cottonseed oil, regular sunflower oil, regular safflower oil and corn oil. These oils are very high in linoleic acid (omega 6s), which, in excess, promotes inflammation in the body.
- There are very few cooking oils that are rich in omega 3 fatty acids, and the oils that are high omega 3 fatty acids, such as flax oil, tend to break down too quickly for high-heat cooking.
- Eat fish regularly. Seafood that is high in omega 3 fatty acids and low in mercury are salmon, herring, sardines, oysters, mackerel (not king Mackerel), trout and shellfish.
- Choose grass fed meats Grass fed beef has a lower omega 6 to omega 3 ratio by approximately 75% in comparison to grain-fed meats. Note that most red meat in Australia is grass-fed.

38

Trans fatty acids

- Diets rich in trans-fats are associated with many chronic conditions, including anxiety and depression.
- Trans fats promote inflammation, an overactivity of the immune system that has been implicated in heart disease, stroke, diabetes, and other chronic conditions (Harvard School of Public Health, 2013).
- Several Australian and international health agencies including the NHMRC and the National Heart Foundation have concluded that trans fats have an effect at least equivalent to that of saturated fats in relation to cardiovascular disease outcomes.

39

Gut health and mental health

- Digestive tract and brain crucially linked.
- Of the number of cells that make up human body, only about 10 per cent are human. The other 90 per cent belong to the trillions of micro-organisms, mainly bacteria, living on or inside you.
- Over the past 5-10 years, research has linked the colonies of bacteria that inhabit the human digestive system (commonly referred to as "gut microbiota") to almost every major lifestyle disease, including obesity, diabetes, cardiovascular disease, allergies and asthma – as well as anxiety and depression.
- At the moment, the vast majority of the research is in animals, rather than humans.

40

Gut microbiota and animal studies

- Changes in composition of gut microbiota contribute to inflammation and obesity.
- Gut microbiota communicates with the central nervous system (including the brain) possibly via neural, hormonal and immune pathways.
- Studies in germ-free animals suggest the gut microbiota is influential in regulation of anxiety, mood, cognition and pain (Cryan & Dinan, 2014) and germ-free mice have an overactive stress response.
- Gut bacteria produces the majority of the body's serotonin.
- Mice studies suggest swapping gut bacteria can change daringness and risk-taking behaviours between animals (Foster, 2013).

41

Specific foods for mental health wellbeing

- Alcohol
- Caffeine

42

Alcohol

- Disrupts sleep (rebound anxiety) and actually exacerbates stress next day. Fall asleep easily but then wake up in middle of night/.
- Blocks REM sleep – considered the most restorative type of sleep.
- Extra kilojoules (inflammatory plus stimulates visceral adiposity (fat around midsection) and extra sugar.

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Caffeine

Coffee and caffeine stimulates adrenalin release – triggering stress and anxiety.

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Inflammatory foods

- **Sugar:** Too much sugar can alert the body to send out extra immunity messengers, called cytokines.
- **Refined grains:** White breads and pastas are typical examples of inflammatory foods. As grains are processed from wholegrain to "white" the bran and germ layers are removed and the nutrients important to health (including mental health) such as B-group vitamins and magnesium are removed. The refined grains that are left at the end of the processing are simply fast-digesting carbohydrates and empty kilojoules.
- **Processed foods:** most processed foods contain added sugars, fats and salts, all of which can contribute to stimulating the body's inflammatory response.
- **Alcohol:** Alcohol is immediate sugar when it is metabolised. When drinking in excess, bacteria can also easily pass through the intestinal lining, leading to irritation and inflammation.
- **Trans fats:** research shows pro-inflammatory impact of trans fats. Trans fats should be eliminated from diet wherever possible.
- **Red meat:** Research suggests red meat can have an inflammatory effect on the body, however grass-fed lean red meat (most Australian red meat is grass fed) may actually be helpful in the management of anxiety (Jacka et al, 2011).

These foods should therefore be minimised in the diet wherever possible.

45

Anti-inflammatory foods

Foods considered to have anti-inflammatory actions (therefore protective in mental health wellbeing).

- Omega 3 fatty acids (fish, flaxseed, walnuts, chia)
- Cold-pressed olive oils (monounsaturated helps balance omega 3:6 ratio)
- Fruits and vegetables (particularly green leafy vegetables)
- Nuts & seeds
- Legumes
- Green tea

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Low-fat and gluten-free foods

- Tend to contain more sugar and refined / processed carbohydrates therefore not recommended for optimal mental health.

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Possible dietary "culprits" in stress, anxiety or depression

Food or nutrient	Impact on mental health	Recommendation
Sugar	Displaces other healthier foods in diet, triggers inflammation, increases stress levels	Reduce and minimise extrinsic (added sugars) in diet
Trans fats	Triggers inflammatory response. Typically found in nutrient poor, highly processed foods.	Eliminate wherever possible.
Saturated fats	Reduce and limit where possible a diet rich in saturated fats is associated with obesity as well as being thought to trigger inflammatory responses.	
Salt	Not commonly associated with stress, anxiety or depression, however as there are many physiological similarities between cardiovascular risk and mood disorders, moderation is wise.	Use in moderation
Alcohol		
Caffeine	Stimulant effect can increase anxiety, cause restlessness, , disrupt sleeping pattern and trigger panic attacks. Commonly over-relied upon in chronic adrenal stress conditions.	Ideally, reduce or avoid caffeine intake
Junk foods	Nutritionally poor, rich in sugar, refined carbohydrates and / or trans and saturated fats. Associated with obesity and systemic inflammation. A diet rich in junk foods associated with anxiety and depression.	Reduce and avoid whenever possible

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Foods considered to be helpful in stress management

Dark Chocolate	Some studies report that dark chocolate can contribute to mood elevation (Ramsey et al, 2013, J Psychopharmacol, Vol. 5, pp. 451-8.) Other research warns that excessive intake of dark chocolate still problematic due to sugar content (Black Dog Institute).	Enjoy in limited portions. Aim for varieties with 70% cocoa or more (the more cocoa – the more polyphenols and less sugar.
Green tea	Anti-inflammatory and antioxidant effects	Good substitute during the day for those looking to reduce caffeine intake – note that green tea does contain caffeine – just less than coffee.
Probiotic yoghurts and fermented foods	Feed the beneficial microbiota (digestive bacteria) – along with a healthy diet	Eat a wide variety of nutritious foods to feed beneficial bacteria in the digestive

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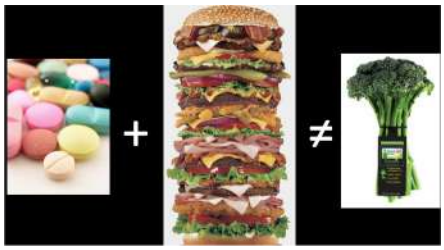
Overall Diet Still Most Important



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Dietary strategies for optimal mental wellbeing

- Prepare your own meals: Nutritional analysis consistently demonstrates commercially-prepared meals almost always contain more kilojoules, sugar, salt and fat.
- Water intake and be mindful of caffeine and adrenal fatigue.
- Timing of meals and snacks – keep blood sugar levels balanced

51

Practical diet questions

- Focus on positive:
  - What was your best day this week?
  - What foods did you eat the day before?
  - What was the healthiest meal you cooked this week?

52

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