Bionutri®

The sun: an underdog in the wellbeing world

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www.bionutri.co.uk

The Sun (*Sol* in Latin)

NASA:

Our Sun is a 4.5 billion-year-old yellow dwarf star – a hot glowing ball of hydrogen and helium – at the center of our solar system.

It's about 93 million miles (150 million kilometers) from Earth

Without the Sun's energy, life as we know it could not exist on our home planet

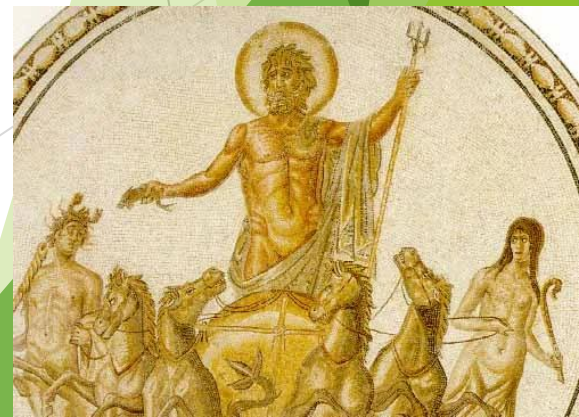
- Diameter - 1.4 million kilometers
- Average sized star
- 15 million degrees C at the core
- 5500 degrees C at the surface
- The Sun orbits the Milky Way – it takes 230 million years to make the full trip
- It takes 8 minutes for light to reach Earth from the Sun

Our star – the sun

The sun has been celebrated by various civilisations and religions for thousands of years:

- **Incas** – the majority of architecture was designed around the worshipping of the sun. Summer solstice was celebrated by a festival called 'Inti Ramyi'
- **Nabateans** - Petra, a famous Nabatean city in Jordan (400 BCE), had many monuments built in relation to the sun
- **Shintoism** – the sun goddess Amaterasu, the most powerful Shinto deity. She brings light to the world. The Japanese imperial family claim to descend from her.

- Eclipses were not scientifically understood so many believed it was a bad omen or a sign from their gods.
- Nearly all the gods of the Roman period possessed solar qualities, and both Christ and Mithra acquired the traits of solar deities. The feast of Sol Invictus (Unconquered Sun) on December 25 was celebrated with great joy



Our star – the sun

Modern Day

Some still choose to celebrate summer and winter solstice, as well as solar eclipses, like the one at the beginning of this year

Are we too afraid of the sun?

Cancer Focus Says Protect Yourself From UV Skin Damage
Down News UK Dec 23

Is it ever safe to sunbathe?
Independent, Aug 23

Best sunscreen for men: Top 7 options for long-lasting protection against harmful UV rays
Hindustan Times, Apr 24

Wales weather: No such thing as a healthy tan – dermatologist
BBC UK, July 23

Kids need sunglasses as much as or more than adults. Here's why.
National Geographic, June 23

The Sun Protection market is worth $11 billion and grows 4% annually

2020 Review

"Studies in the past decade indicate that insufficient sun exposure may be responsible for 340,000 deaths in the United States and 480,000 deaths in Europe per year, and an increased incidence of breast cancer, colorectal cancer, hypertension, cardiovascular disease, metabolic syndrome, multiple sclerosis, Alzheimer's disease, autism, asthma, type 1 diabetes and myopia".

https://pubmed.ncbi.nlm.nih.gov/32668607/

"About 8,290 people are expected to die of melanoma [in 2024, USA]"

(100, 000 diagnosed)

American Cancer Society

WHO 2006 report

“Excessive UV exposure accounts for only 0.1% of the total global burden of disease in disability-adjusted life years (DALYs), according to the 2006 World Health Organization (WHO) report The Global Burden of Disease Due to Ultraviolet Radiation”

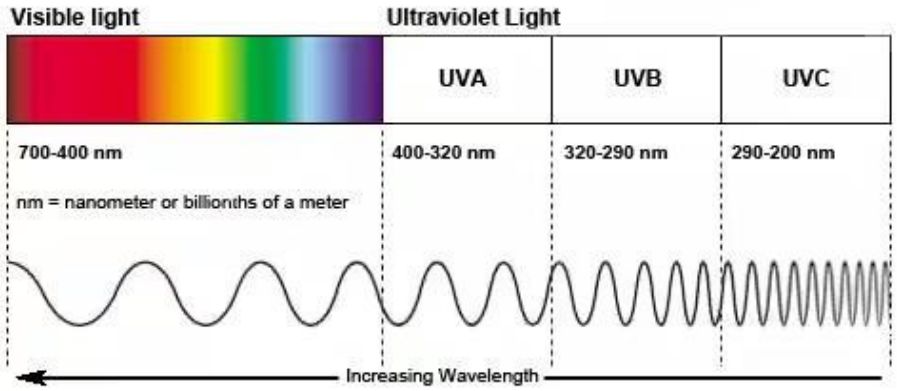
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2290997/

Interestingly in the 1800s, ricket cases soared due to the lack of vitamin D synthesis because people covered their skin all year round.

Also Tuberculosis became more prevalent, and this has been linked to a lack of solar exposure.

It isn’t just about vitamin D

Ultraviolet Rays



Ultraviolet (UV) rays belong to the electromagnetic spectrum

They travel at the same speed of light in a vacuum as gamma and x-rays
= (3 x 10^8 m/s)

UV rays have shorter wavelengths than visible light but longer than X-rays.

These rays are produced by processes at high temperatures such as from the Sun (and tanning beds).

Overexposure to UV rays can lead to skin & DNA damage leading to burns and cancer

We cannot see or feel UV, but some insects can!

We can feel the heat of infrared

UltraViolet Rays (UVR)

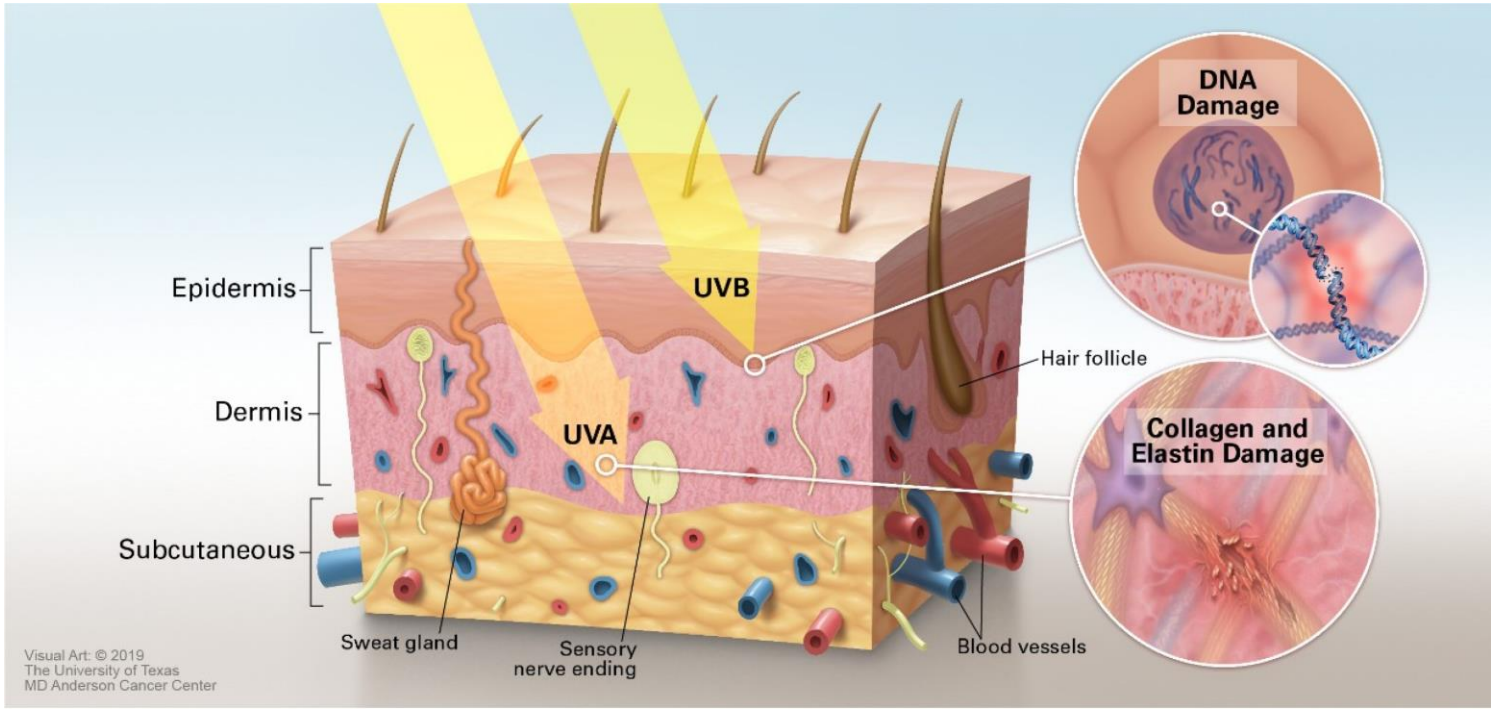
UVA	UVB	UVC
Longest Wavelength	Medium wavelength	Shortest wavelength
Affects Dermis (deeper layers of skin) Can even go through glass	Affects Epidermis (top layer of skin)	Absorbed by atmospheric ozone
Causes ageing – damages collagen & elastin	Causes redness/burning/ Melanomas via damaging DNA. Can cause cataracts.	
Strongest at the Poles (think daylight)	Strongest at the Equator (think heat)	
315 to 400 nm/wavelength	280-315 nm	100-280 nm
95% of Earth's radiation	5% of Earth's radiation	

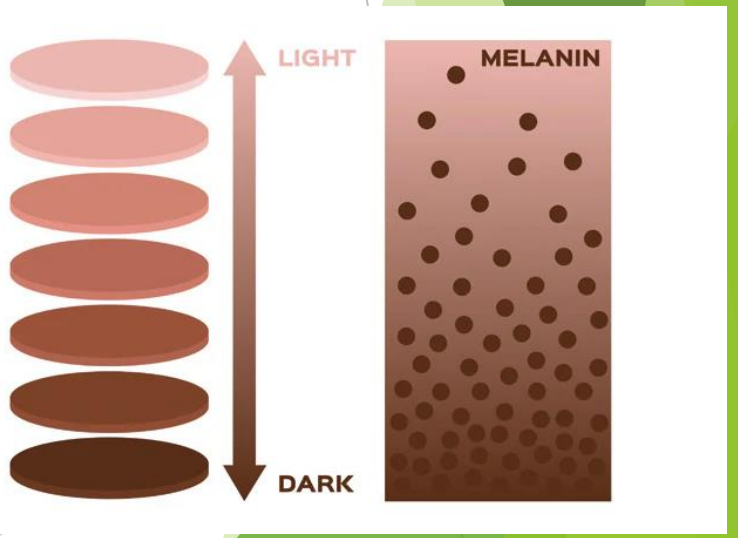
UVR and skin

Melanin is a substance in the skin that creates pigment

More melanin = more pigment = more protection from UVR

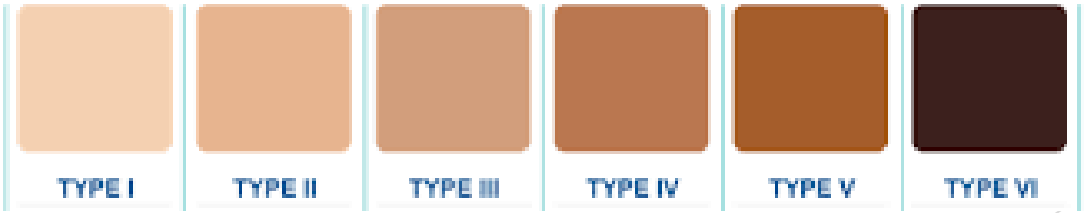
Albinism – congenital absence or very low melanin and therefore pigmentation





Skin Type	Skin Colour	Reaction	Time in high/mod UV
I	Pale/white Often freckled & blue eyed	Always burns	5-10 mins
II	White/beige	Burns easily Tans minimally	20 mins
III	Beige	Burns moderately Tans gradually	30 mins
IV	Light brown	Burns minimally Tans easily	50 mins
V	Moderate Brown	Rarely burns Tans easily to dark brown	60 mins
VI	Dark Brown	Never burns Tans profusely	60 mins+

The Fitzpatrick Scale



UV Protection

Conventional Sun cream

- Nano-particles (smaller than 100 nanometers (one 100 billionths of a meter))
- They absorb rays in a chemical reaction that dissipates the heat back off the skin
- Some are as small as 10-20 nanometers
- Some worry about the effects this has in the body
- Cancer.org.au say these nano-sun creams do not pose a health risk, but it is being monitored
- Nano particles are dangerous to marine and reef life. They are absorbed and can kill coral
- European Commission has concerns over titanium dioxide, especially inhaling or consuming them. Also on the skin they can become pro-oxidative
- Ingredients used: avobenzone, cinoxate, dioxybenzone, ensulizole, homosalate, meradimate, octinoxate, octisalate, octocrylene, oxybenzone, padimate O, and sulisobenzone

UV Protection

Conventional Sun cream Safety

FDA found these chemicals to be not generally recognized as safe and effective due to insufficient data. They also found that oxybenzone, octinoxate, octisalate, octocrylene, homosalate and avobenzone are all systemically absorbed into the body after one use.

In 2021 the European Commission published preliminary opinions on the safety of 3 organic ultraviolet, or UV, filters, oxybenzone, homosalate and octocrylene.
It found that 2 of them are not safe in the amounts at which they're currently used. It proposed limiting concentration to 2.2% for oxybenzone and 1.4% for homosalate.

Hundreds of sunscreens made in the U.S. use them at concentrations far above these recommendations.

These chemicals have been found it breastmilk, urine and blood plasma samples.

https://www.ewg.org/sunscreen/report/the-trouble-with-sunscreen-chemicals/

UV Protection

Mineral Sun cream

- Uses zinc oxide (white)
- Titanium dioxide is often mixed in too, so the cream isn't so white
- Reflect the sun's rays like a mirror to protect exposed skin
- Do not break down as readily in the sun as chemical ingredients
- Usually the other ingredients in the cream are natural and more nourishing to skin
- Reef safe - zinc oxide does not dissolve in seawater. Instead, it rapidly settles to the seafloor and becomes part of the sediment
- Deemed safe and effective by FDA & EU Cosmetics Regulation

There are some inhalation concerns with mineral sun creams (avoid powder or spray forms)

My Favourite Suncreams

https://uk.naturaltoneskincare.com/collections/all-products

https://www.greenpeople.co.uk/products/organic-children-sun-cream-spf30-scent-free-150ml

American brand
www.badgerbalm.com

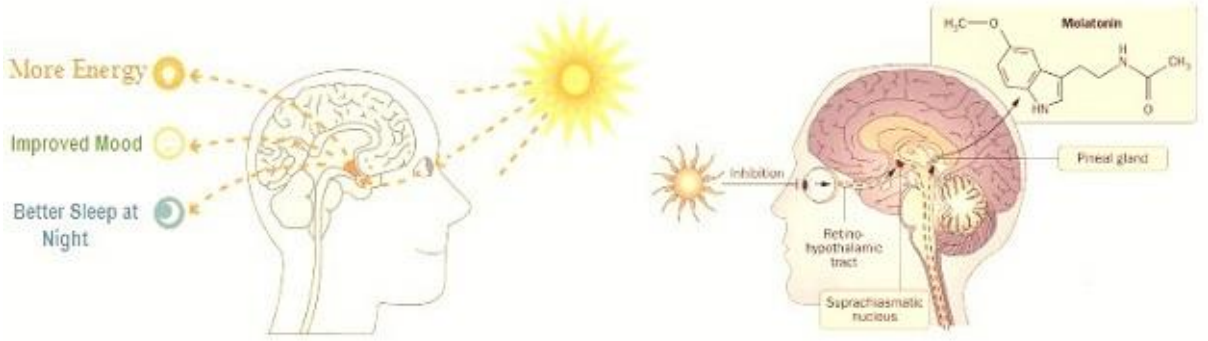
Benefits of sun light

- Vitamin D production
- Immune support
- Circadian rhythm balance
- Metabolic health
- Cardiovascular disease prevention
- Skin support

The importance of natural light

“Daylight is ubiquitous and is crucial for mammalian vision as well as for non-visual input to the brain via the intrinsically photosensitive retinal ganglion cells (ipRGCs) that express the photopigment melanopsin. The ipRGCs project to the circadian clock in the suprachiasmatic nuclei and thereby ensure entrainment to the 24-hour day-night cycle, and changes in daylength trigger the appropriate seasonal behaviours.

The ipRGCs also project to the perihabenular nucleus and surrounding brain regions that modulate mood, stress and learning in animals and humans. Given that light has strong direct effects on mood, cognition, alertness, performance, and sleep, light can be considered a "drug" to treat many clinical conditions”. https://pubmed.ncbi.nlm.nih.gov/33129807/



https://www.firstlightpsych.com/blog/mood-disorders/seasonal-disorder

The Importance of the Circadian Rhythm

New science suggests that 15% of our genes are regulated directly by the circadian rhythm

Circadian rhythm or " circa-diem" (Latin for approx. a day)

- ✓ All living things have a circadian rhythm or body clock lasting 24hrs
- ✓ Internal time keeping device
- ✓ Should be in sync with rising and setting of the sun
- ✓ Many bodily systems are calibrated to the lack or presence of daylight
- ✓ Majorly affects metabolism, sleeping & mating/reproduction
- ✓ Can get disrupted, which lead to health issues inc SAD

elenabsl / Shutterstock.com

The sun and the circadian rhythm

A 2010 study found that:

“Bright light exposure significantly reduced plasma cortisol levels at both circadian phases studied, whereas dim light exposure had little effect on cortisol levels.

The finding of an acute suppressive effect of bright light exposure on cortisol levels supports the existence of a mechanism by which photic information can acutely influence the human adrenal glands”.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3686562/

Potentially helpful for excess cortisol

Sunlight and Seasonal Affective Disorder (SAD)

"A type of depression that comes and goes in a seasonal pattern" NHS

Affected mostly by women, shift workers, young adults & those away from equator

Caused by:

- Upset circadian rhythms
- Vitamin D deficiency
- Over production of melatonin
- Insensitivity of the eyes to environmental light
- Difficulty in regulating the neurotransmitter serotonin

Sunlight and Seasonal Affective Disorder (SAD)

Bright Light Therapy (BLT)

- Can help in as little as 4 weeks
- Used primarily for SAD
- Positive outcomes for depression & some eating disorders
- Also: adult ADHD-linked SAD had improved symptoms

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6746555/

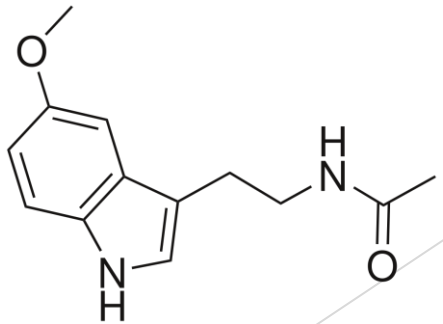
Melatonin's importance

- Secreted by the pineal gland in response to the lack of light
- Travels via the bloodstream to different parts of the body where receptors pick up the melatonin
- It's amphiphilic – water and fat soluble
- Highest concentrations in mitochondria – reduces oxidative stress

In animals it could be melatonin that tells the body what season it is. Needed for hibernation & reproduction.

<u>Uses:</u>

- Acts as a hormone
- Antioxidant – 1 molecule can clean up 10 ROS



Melatonin

- Plays an essential role in signalling relaxation and reducing body temperature
- Helps to control the release of sex hormones = important for menstrual regularity
- High or low levels of melatonin are not direct causes of any pathology
- Low levels are associated with poor sleep patterns = indirectly can drive poor health
- Support optimal levels by being exposed to morning UV light without sunglasses & avoiding blue light
- Food sources: rice, tomatoes, tart cherries, milk & olives (low levels)

Supplementing with melatonin theoretically could make SAD worse.

Is low mood & SAD all about the brain?

An experiment on mice at Caltech, found that EC cells, which mostly make serotonin, depend on microbes to make adequate serotonin.

https://www.caltech.edu/about/news/microbes-help-produce-serotonin-gut-46495#:~:text=Although%20serotonin%20is%20well%20known,%2C%20cardiovascular%20disease%2C%20and%20osteoporosis

"Genes of the brain and intestinal tract are quite similar, especially related to the formation of the neuronal synapse, thus some gene mutations can lead to abnormalities in both the brain and gut.

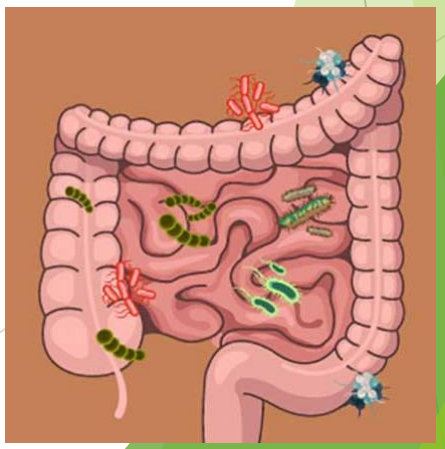
. . .there is a relationship between microbiota and mood disorders, but also find that administering prebiotics, probiotics and suitable antibiotics can relieve depression and anxiety symptoms"

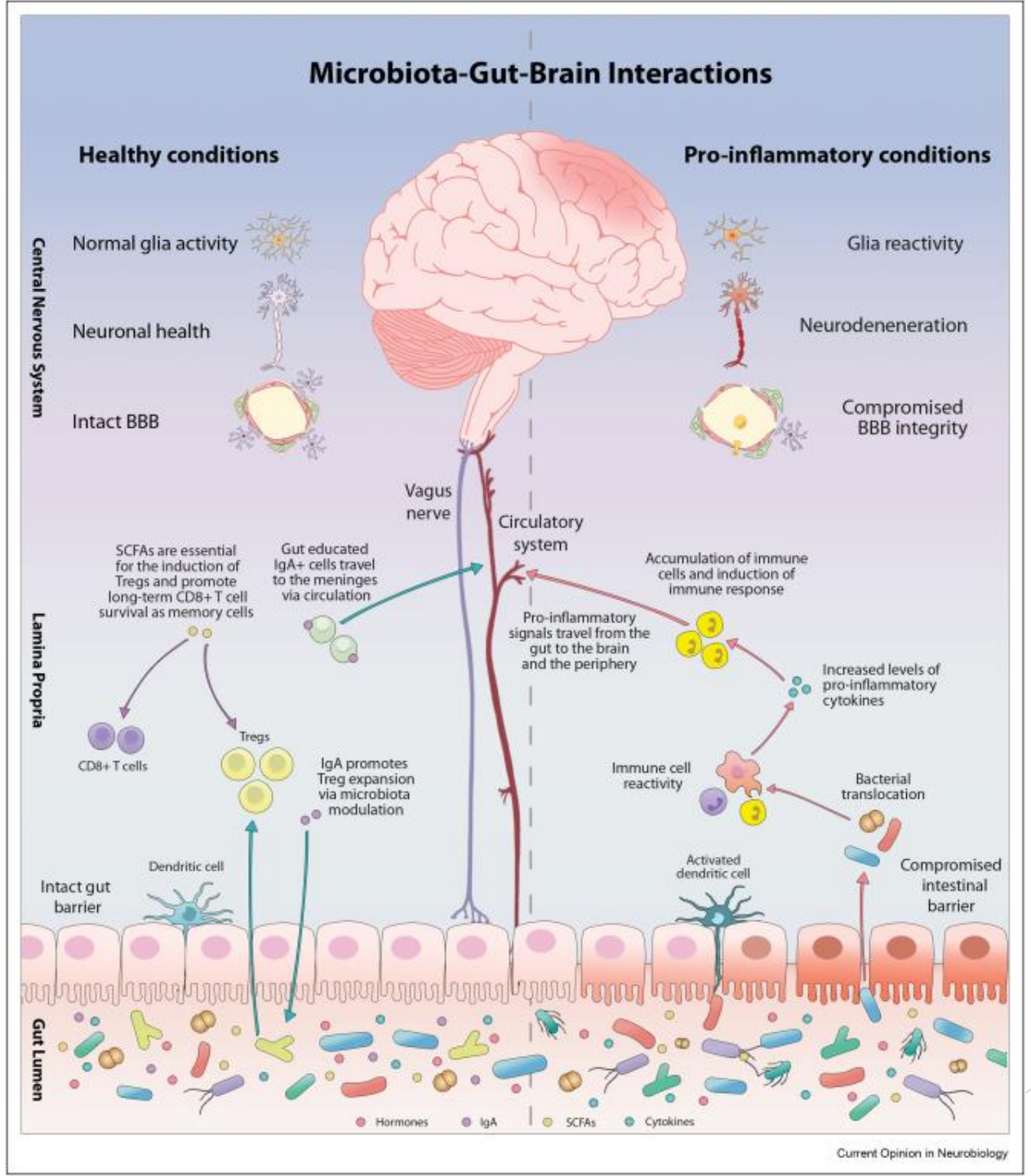
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5987167/

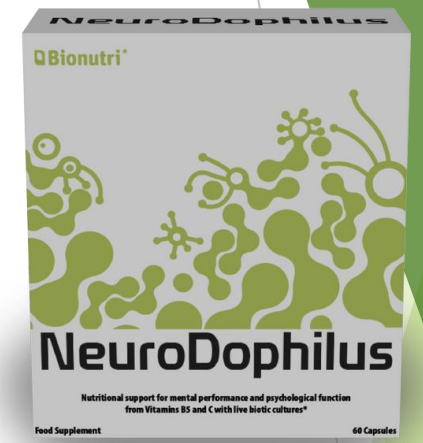
IBS/IBD sufferers are more likely to have depression & anxiety

More communication from gut to brain via vagus nerve

Calprotectin
Beta defensin2
Secretory IgA
Zonulin
Microbes
Parsites
Fungi







Microbiota-immune-brain interactions: A lifespan perspective
2022

https://www.sciencedirect.com/science/article/pii/S0959438822001465

Skin-Gut-Axis

- L. rhamnosus improves immune function and skin barrier function through expression of tight junction, skin proteins and increased ceramide production
- B. breve B-3 significantly suppresses the changes of trans-epidermal water loss, skin hydration, epidermal thickening and attenuates the damage to the tight junction structure and basement membrane induced by chronic UVB irradiation
- Zinc is present in dermis and epidermis
- Moderate zinc deficiency may cause pigmentation changes
- Vit D3 and K2 for photoprotective effects and elastin production

Sun Exposure and Metabolism

Since the 1800s, the metabolic benefit of the sun's rays has been observed:

- Congenital hypothyroidism was linked to low sun exposure
- Eskimo women suffered from amenorrhea during the 'long polar night'
- Country children who spent more time outdoors suffered less from TB and rickets

"Previous studies have indicated that morning bright light exposure may impact metabolism in a clinical population. Two case studies reported a reduction in insulin dose after phototherapy in insulin-dependent diabetic patients with winter depression [58,59], suggesting a positive impact on glycemic control".

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10056135/

Sun Exposure and Skin Health

Heliotherapy – *the use of natural light for the treatment of certain skin conditions* (DermNet)

- Both psoriasis and atopic dermatitis have been alleviated by heliotherapy
- A small study of 22 people found their skin improved after 2 weeks of being in the sun in the Canary Islands
- For the dermatitis group, the effects lasted 3 months
- For psoriasis, it only helped while being exposed to sunlight

https://www.medicaljournals.se/acta/content/abstract/10.2340/00015555-2028

Sun Exposure and Immunity

Observations in the late 1800/early 1900s found that in Ulcerating Lupus sufferers (autoimmune connective tissue disease), light treatment helped dilate the blood vessels and allowed white blood cells to aid healing (Kellogg, 1910).

Sunlight also can act as an antibiotic.
Early 1900s observations found that light destroyed various bacteria and parasites including tetanus, even more effectively than germicides of that time period.

UV lamps are now used for sterilisation in the medical system

Sun Exposure and Immunity

The husband-and-wife team of William F. Wells, an engineer, and physician Mildred Wells. In 1935, they documented that an ultraviolet lamp placed in a room killed off bacteria in the air.

They placed “irradiation chambers” under the ceilings of classrooms. Air would naturally enter the chambers, then exposed to UV rays.

The results were striking.

In classrooms with the device - 14.5% of students were infected with measles during a 1941 epidemic.

In the non-irradiated classrooms - 55.3 % were infected.

(This was decades before the measles vaccine was invented)

Sun Exposure and Immunity

Freund, a physician in Germany in the turn of the century (18/1900s) found that light exposure from incandescent light apparatus was able to cure Rheumatic sufferers who were unable to walk.

It was also helpful on local application for acne vulgaris, and some types of dermatitis and neck abysses.

John Harvey Kellogg who wrote the book ‘Light Therapeutics’ extensively researched the used of UV rays on various ailments

Sun Exposure and Jaundice

Phototherapy is used for the treatment of hyperbilirubinemia (jaundice) in newborns. This common therapy lowers the serum bilirubin level by transforming bilirubin into water-soluble isomers that can be eliminated without conjugation in the liver.

Daylight (UV) can also be used to ***prevent*** jaundice. It helps breakdown bilirubin, but not to the same extent as phototherapy. It can be a good adjunct. Do not place u6months in direct strong UV though!

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8259558/

Vitamin D from UVR

At least 1,000 different genes governing virtually every tissue in the body are now thought to be regulated by 1,25-dihydroxyvitamin D3 (1,25[OH]D) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2290997/

Vitamin D synthesis

1. 7-dehydrocholesterol in the skin absorbs UVB to make previtamin D3

2. The liver and kidneys metabolise it into 25-hydroxyvitamin D (the circulating form) and the active form (1,25-dihydroxyvitamin D)

Our vitamin D webinar:

https://www.bionutri.co.uk/vitamin-d

Vitamin D and immune actions

- ✓ Stimulates the production of the important antimicrobial peptide, LL-37, which helps combat skin infections
- ✓ Inhibits B cell proliferation and blocks B cell differentiation and immunoglobulin secretion
- ✓ Affects T cell maturation with a skewing away from the inflammatory Th17 phenotype
- ✓ Suppresses T cell proliferation
- ✓ Decreases production of inflammatory cytokines (IL-17, IL-21)
- ✓ Inhibits monocyte production of inflammatory cytokines such as IL-1, IL-6
- ✓ Plays an important part in the innate antimicrobial response
- ✓ Vitamin D can modulate key mediators of apoptosis (cell death) in many cells

Vit D is low in patients with autoimmunity, especially lupus, multiple sclerosis and rheumatoid arthritis

Sun Exposure and Blood Pressure

A study from the University's of Southampton and Edinburgh found that sunlight alters levels of nitric oxide (NO) in the skin and blood, this potentially reducing blood pressure.

"When exposed to sunlight, small amounts of NO are transferred from the skin to the circulation, lowering blood vessel tone; as blood pressure drops, so does the risk of heart attack and stroke".

Martin Feelisch, Professor of Experimental Medicine and Integrative Biology at the University of Southampton

This backs up observations from the early 1900s

24 healthy individuals were exposed to ultraviolet (UVA) light from tanning lamps for 2 sessions of 20 minutes each.

In 1 session, the volunteers were exposed to both the UVA rays and the heat of the lamps.

In another, the UV rays were blocked so only the heat of the lamps affected the skin.

The results - UVA exposure dilated blood vessels, significantly lowered blood pressure, and altered NO metabolite levels in the circulation, <u>without changing vitamin D levels.</u>

Carotenoids – Internal Protection

- Around 850 carotenoids found in nature
- Essential for plant life and have similarities to chlorophyll.
- Animals and humans cannot make their own

Sources: Fruits, vegetables, egg yolks and oily fish.

- ✓ Act as antioxidants, precursors to retinol, contributors to reproduction and they are immune supporting and photo-protective
- ✓ Carotenoids are effective in protecting skin from UV exposure, by scavenging singlet oxygen and peroxyl radicals

In our tissues, carotenoids have the potential to quench our exposure to radiation, their resilience to radiation exposure acts almost as a systemic sunscreen. As those carotenoids themselves oxidise they must then be replaced, hence why consuming carotenoid-rich foods daily is important

Carotenoids – beta carotene

- ✓ First carotenoid found, isolated from carrots in 1831 by a German chemist Dr Wackenroder
- ✓ They accumulate in the skin and help to protect our bodies from our external environments by neutralising free radicals
- ✓ Helps to reduce the impact of excess UV in the skin
- ✓ Accumulate in other organs too, such as the eyes
- ✓ Helps to support the normal functioning of the immune system and supports mucous membrane health

Sources: carrots, spinach, lettuce, tomatoes, sweet potatoes, broccoli, cantaloupe, and winter squash

Carotenoids – astaxanthin

- ✓ Often known for it's anti-ageing properties
- ✓ First identified in 1938 by Dr Richard Kuhn who later won a Nobel Prize in chemistry for his studies on vitamins and carotenoids
- ✓ It can help to reduce the severity of fine lines and wrinkles
- ✓ May reduce the degradation of collagen and elasticity in the skin

Sources: algae, yeast, salmon, krill, shrimp and lobster

Carotenoids – lutein & zeaxanthin

- ✓ Both are closely related
- ✓ Have high concentrations in the eyes and help protect them from phototoxic activity caused by free radicals
- ✓ Lutein is on the of the most common carotenoids found in nature, it is particularly high in egg yolks

A RCT in 2006 found that older adults eating just <u>one</u> egg per day, significantly increase serum lutein and zeaxanthin levels, without increasing cholesterol

https://pubmed.ncbi.nlm.nih.gov/16988120/

Carotenoids – lycopene

- ✓ Discovered in 1876 by the Swiss chemist Richard Willstatter and Heinrich Escher
- ✓ Then later isolated by Paul Karrer
- ✓ Lycopene may be more effective when consumed together with other carotenoids

Sources: red carrots, red peppers, tomatoes, sweet potato, blood orange, strawberries, cranberries, red cabbage

Green Tea

- High in antioxidants such as polyphenols
- Particularly epigallocatechin-3-gallate (EGCG) has seen to be protective
- Studies have found consumption internally (and also topical use) can protect the skin from UVR damage

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3390139/

A word on fat absorption

"Dietary fat increases carotenoid bioavailability by facilitating their transfer to the aqueous micellar fraction during digestion"

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5306026/#:~:text=Dietary%20fat%20increases%20carotenoid%20bioavailability,optimal%20carotenoid%20absorption%20remained%20unexplored

Signs of fat malabsorption:

- Greasy or floating stools
- Bloating, gas and loose stools
- Nausea, especially after rich/fatty foods
- Dry skin including eczema-prone

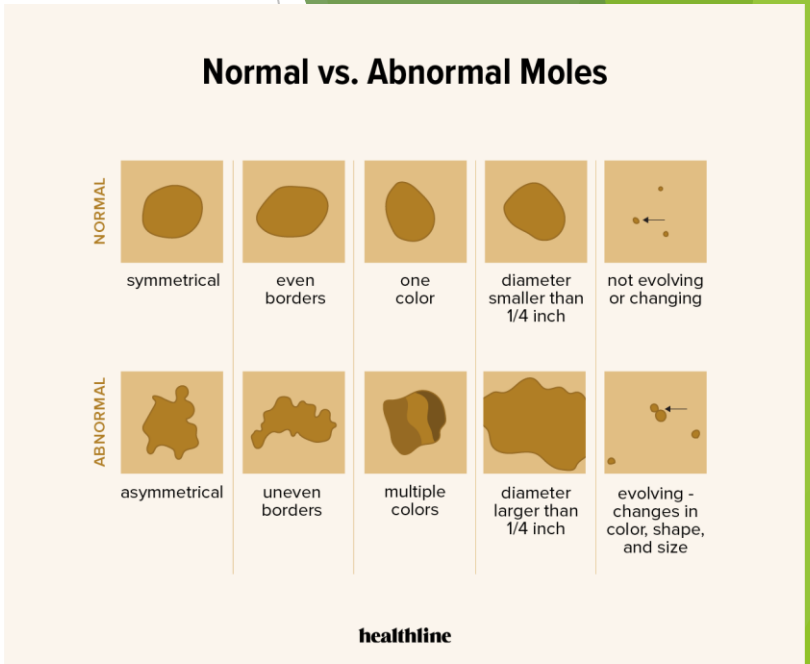
Support: bitter herbs e.g. artichoke, unpasteurised apple cider vinegar, good fats e.g. olive oil, Taracyn® & HepaDophilus®

Studies have shown that at least 10g of fat is needed during a meal to absorb carotenoids like lycopene, and a little more for raw food sources – 15g.
E.g. 1-1.5 tbsps of extra virgin olive oil

Vitamins A, D, E & K rely on good fat absorption too

Sun Safe Tips

- ✓ Stay out of the sun between 11am - 2pm
- ✓ Take sun breaks – avoid long-term exposure
- ✓ Cover up with hats and long sleeves if need to
- ✓ Re-apply (mineral) sunscreen every 2-3 hours if exposed
- ✓ Gradually build up to tan, depending on skin type
- ✓ Keep skin hydrated
- ✓ Include lots of antioxidant rich foods in diet, especially carotenoids
- ✓ Stay hydrated
- ✓ Never expose burnt skin or new scars to the sun
- ✓ If you are concerned about a mole or new skin appearance, see a GP



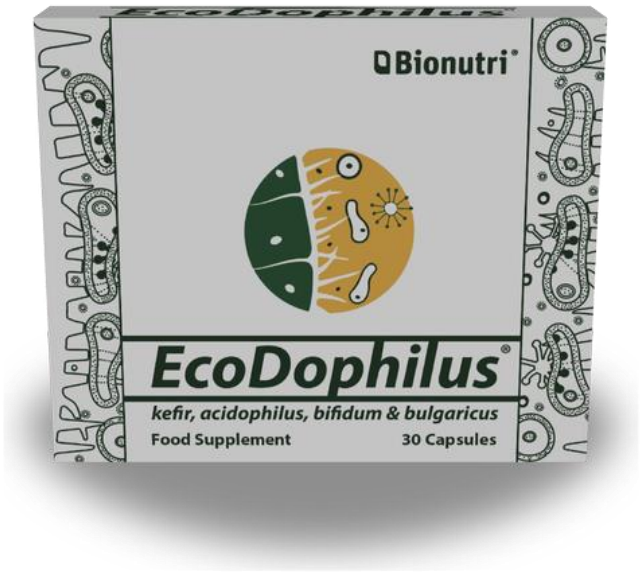
EcoDophilus®

Resident dominant bacteria (L. acidophilus & B. lactis)

- Reduces risk of pathogenic proliferation
- Colonises small and large intestine
- Help balance inflammatory processes

Transient (L. bulgaricus & L. kefir)

- Enables other good bacteria to flourish

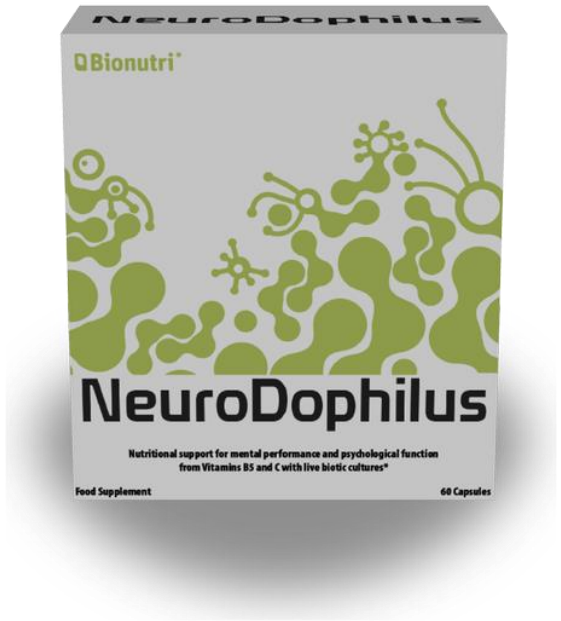


- ➢ For sensitive clients and long-term maintenance
- ➢ Dose can be increased in cases of gastroenteritis
- ➢ Can be titrated for difficult complex cases

FOS free

NeuroDophilus®

- ✓ B. lactis, B. bifidum & B. longum
- ✓ L. rhamnosus & L. helveticus
- ✓ Buffered Vit C & B5
- ✓ Recent studies have shown the benefits of Bifidobacterium, alongside these lactobacillus they've been shown to support the normal regulation of mood, cognition, pain and cortisol levels.



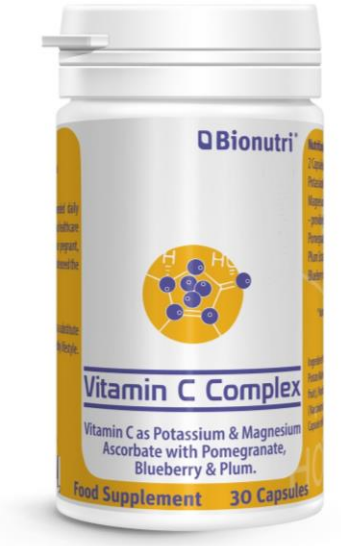
Carotone®

- Zeaxanthin
- Astaxanthin
- Lycopene and Lutein
- Beta carotene & CoQ10
- Vitamin E, D3 & K2

- ➢ Especially supportive for eyes health and protection from UVR related skin damage
- ➢ Potent antioxidant for cellular health
- ➢ Mixed in avocado oil as the fatty acid profile is the perfect carrier for lipid nutrients

Vitamin C Complex (2 caps)

- 1000mg potassium & magnesium ascorbates
- Pomegranate, Plum and Blueberry extracts



- Vitamin C can help to reduce histamine production
- Protects against the development of chronic disease
- Adrenals have a very high concentration of ascorbate (vitamin C)
- Plays a vital role in connective tissue, the endocrine & immune system
- Levels deplete with excess stress and age
- Formulated to match how it's found it nature (with broad-spectrum polyphenolic compounds)
- Alongside vitamin E and carotenoids can support skin against UV exposure

Omega 3

Fish Oil

- DHA 500mg
- EPA 100mg
- Vitamin D3 400iu and 5mg Vitamin E

- ➢ May help protect the skin from UV
- ➢ Helps regulate inflammatory processes
- ➢ Helps to increase LDL particle size
- ➢ Helps to lower circulating triglycerides
- ➢ Vital for nervous system ands brain health

Omega 3

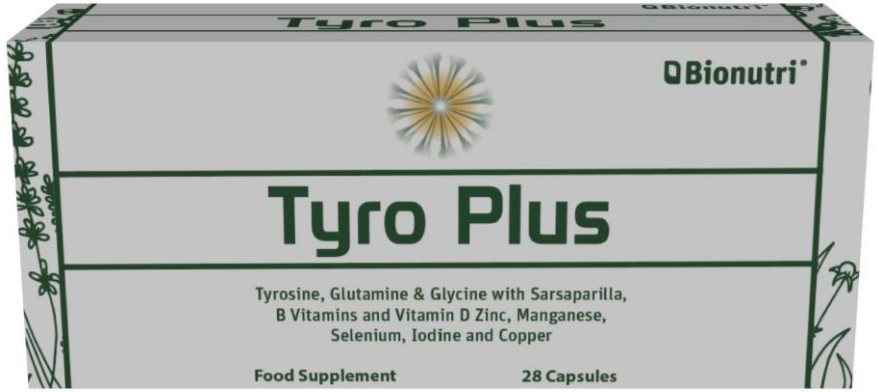
Vegan DHA

- DHA 500mg
- EPA 8mg
- Vitamin E, C and rosemary extract

- ➢ May help protect the skin from UV
- ➢ Helps regulate inflammatory processes
- ➢ Helps to increase LDL particle size
- ➢ Helps to lower circulating triglycerides
- ➢ Vital for nervous system ands brain health

Tyro Plus

- Tyrosine, Glutamine & Glycine
- Sarsaparilla root extract
- Zinc, Iodine & Selenium
- Vitamins B1, B2, B3, B6, D3
- Manganese & copper

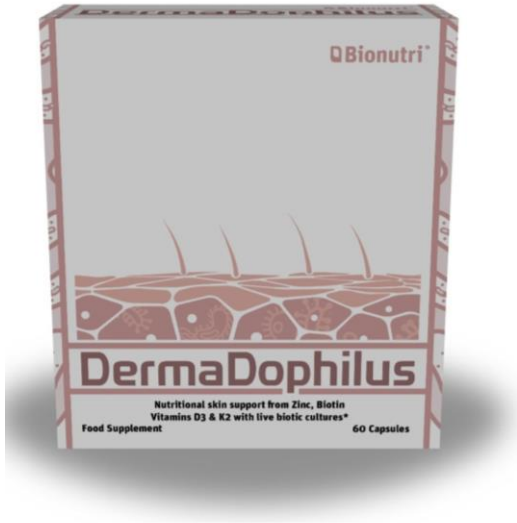


- ✓ Overall Endocrine system support
- ✓ Vitamins, minerals, amino acids and botanicals
- ✓ For those struggling to get out of bed
- ✓ Aids basic metabolism –aid sleep and overall endocrine system

DermaDophilus

- Bifidobacterium animalis subsp. Lactis
- Lactobacillus rhamosus
- Bifidobacterium breve
- Lactobacillus acidophilus

20 billion live bacteria



- Zinc citrate (25mg)
- Vitamin D3 (400iu)
- Vitamin K2 (400mcg)
- Biotin (400mcg)
- Vitamin B2 (10mg)

Nutrition Information		NRV**
2 capsules (recommended daily intake) provide		
Bifidobacterium animalis subsp. lactis CUL34	20 Billion Viable Cells	
Lactobacillus rhamnosus CUL63		
Bifidobacterium breve CUL74		
Lactobacillus acidophilus CUL60		
Zinc Citrate	25mg	
Providing actual Zinc	7mg	70
Vitamin D3	10µg	200
Providing activity	400iu	
Vitamin K2	400µg	533
Biotin	400µg	800
Vitamin B2	10mg	714

- ➢ Supports skin integrity
- ➢ Supportive for allergy-prone skin

Relevant Webinars on-demand

Winter Blues - https://www.bionutri.co.uk/winter-blues

Primary Carotenoids - https://www.bionutri.co.uk/primary

Circadian Rhythm - https://www.bionutri.co.uk/circadian-banner

Vitamin D - https://www.bionutri.co.uk/vitamin-d

Practitioner Support (technical support)

Practitioner area on our website – www.bionutri.co.uk
- upcoming free webinars
- previous CPD webinars
- product info
- technical team contact details

Practitioner Facebook group & page – facebook.com/bionutriuk
- fellow practitioners
- responsive help from technical team

1:1 Technical Support – via Zoom, Teams, phone, email
- Sue McGarrigle ND, mBANT, mGNC suem@bionutri.co.uk
- Edward Joy, Herbalist ed@bionutri.co.uk
- Rosie Rayner, ND, mANP rosie@bionutri.co.uk

Instagram:

@bionutriuk

Thank you

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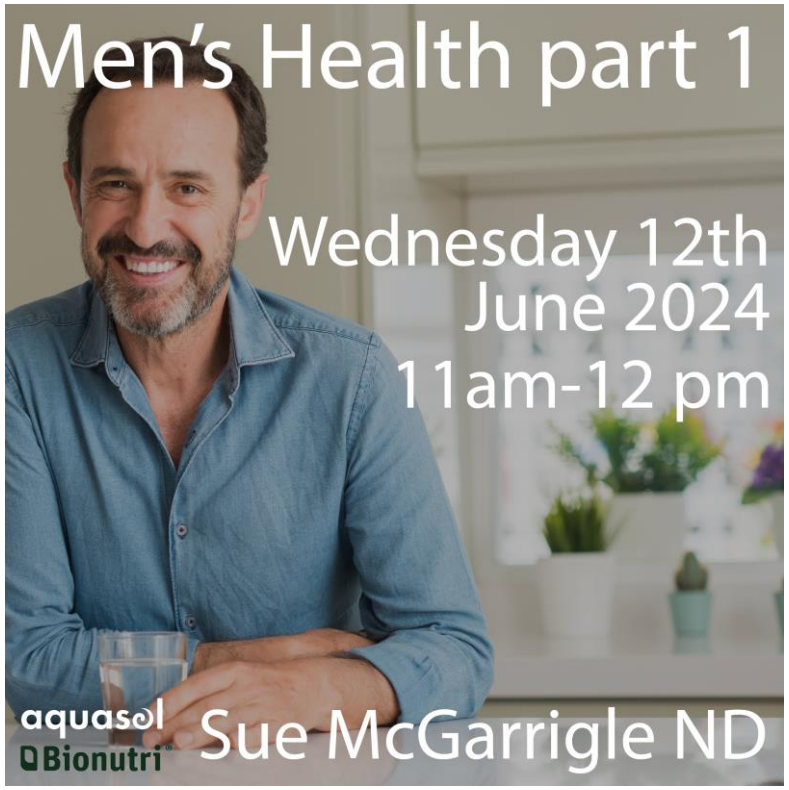
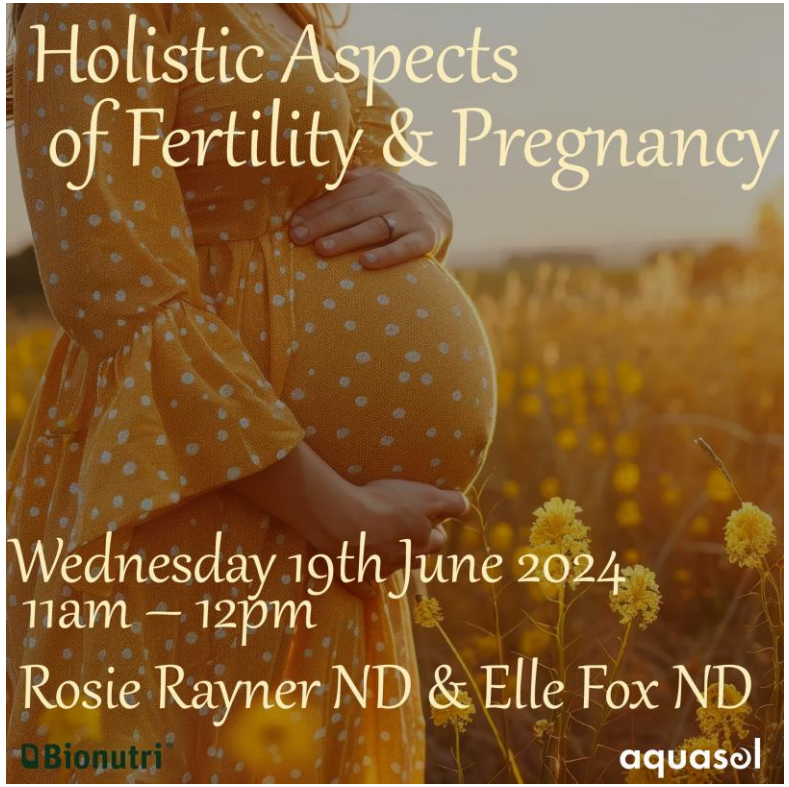
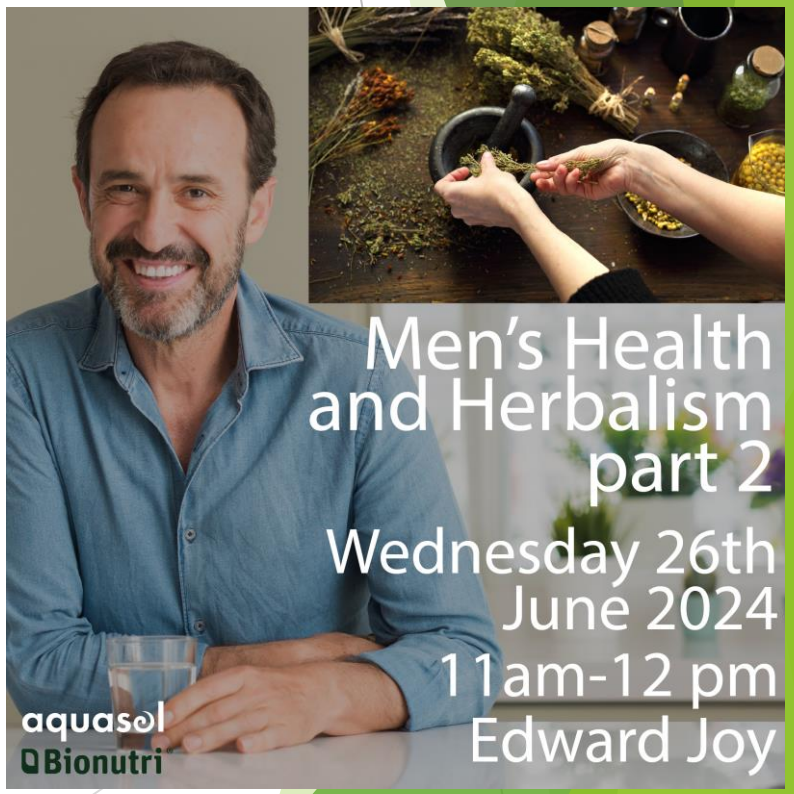
June webinars







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