

Relax your mind

Health benefit solutions

Relaxation and Sleep

- Relaxation and sleep are essential for health and a sense of wellbeing
- Consumers value the ability to wind down and rest after a busy day, or just take a break
- There is a gap between the consumers' need for relaxation and sleep products, and their knowledge of effective solutions; this gap can be used to inform consumers and generate interest in new products
- Nutritional ingredients can provide a safe and natural solution:
 - Vitamins and nutritional lipids
 - Herbs from around the world
 - Trusted nutraceuticals
- Sleep and relaxation are two distinct marketing concepts, but they are linked since being relaxed helps you to fall asleep
- Relaxation is like changing gears: people want to slow down and change their state of mind to a more gentle state, but they want to remain awake and alert
- Sleep is a vital physiological process that requires a long break in consciousness
- The challenge for formulators is to develop products which cater to these two separate categories:
 - Products to support relaxation without causing drowsiness
 - Products to naturally support healthy sleep

Globally, many consumers appreciate relaxation and sleep products to help them achieve balance in their lives

Nutrients for a relaxed mind

Vitamins

Quali®-B (B1, B2, B3, B5, B6, B12)
Quali®-D
Quali®-E

Herbal ingredients

Chamomile
Lemon Balm
Hops

Minerals

Magnesium
Iron
Zinc
Calcium

Nutraceuticals

Tryptophan
L-Theanine

Nutritional lipids

ROPUFA®/life'sDHA™
LC omega-3 PUFA



How can we Health you?

Relaxation is part of achieving the balance needed to enjoy life to the fullest; the pace everyday modern living is tempered by being able to wind down and take a break.

DSM's broad portfolio of innovative, high-quality and safe nutrients, combined with our consumer insights, market knowledge and application expertise, can help your relaxation and sleep positioned products attract more consumers.

We are the only integrated premix, vitamin and nutraceutical manufacturer capable of creating and delivering tailor-made formulations to you anywhere. Blend in our extensive scientific expertise, technical know-how, global presence and total quality assurance for your peace-of-mind.



Via our global network of blend facilities we create value-adding nutrient combinations custom-made for you. Our Quali®-Blends can offer the right balance of ingredients supporting sleep and relaxation.

DSM can help you get to market faster with appealing relaxation solutions that work.

Relax your mind

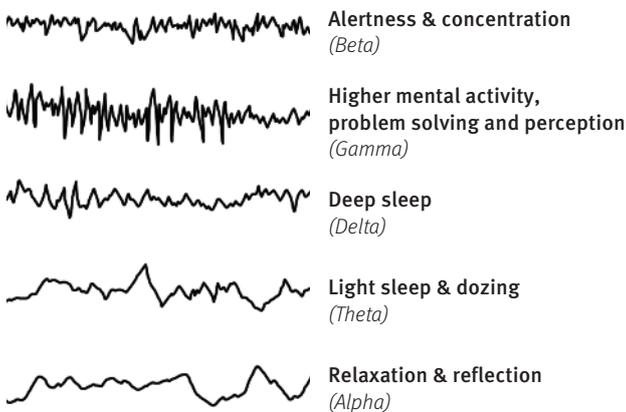
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The science behind sleep and relaxation

Relaxation and sleep both contribute to our quality of life by allowing our minds and bodies to rest and recuperate. Giving the body a chance to unwind, and getting a good night's sleep, both counteract stress and may help prevent chronic diseases.

Brain waves mark our state of consciousness from active thought through quiet relaxation to deep sleep. An electroencephalogram (EEG) allows scientists to measure brain waves that can be used to determine the state of relaxation and sleep quality. By recording brain wave activity, we are able to objectively measure levels of alertness and relaxation as illustrated below.



Relaxation

Relaxation can be defined as a feeling of refreshing tranquility and an absence of tension or worry. The most important brain waves involved in relaxation are the alpha and beta waves. Beta waves signify alertness, active, busy or anxious thinking and active concentration. Alpha-waves are associated with physical and mental relaxation and meditation—the quiet reflection achieved when we take a calming break. Stress is associated with a reduction in alpha-waves during wakefulness.

In response to stress, our bodies produce hormones to help us with our “fight or flight” response. Cortisol, adrenaline and noradrenaline are the main hormones responsible for classical symptoms of stress: increased heart rate and blood pressure, and a decreased sensitivity to pain. These hormones prepare the body to physically respond to stress, but may be counter-productive in modern life. Some negative consequences of the hormones’ actions include insulin resistance and a suppressed immune system, both related to chronic disease risk.

Gamma-aminobutyric acid (GABA) is the chief inhibitory neurotransmitter in the central nervous system, which means that it reduces brain stimulation. Specific sites on brain cells are sensitive to GABA. When GABA binds to the sites, the brain cells’ actions are decreased and this results in a relaxing effect. Certain nutrients can help manage these specialized mood chemicals.

DSM offers a wide range of nutritional solutions that can help to support sleep and relaxation

Sleep

Sleep is a vital physiological process with restorative functions. During deep sleep, growth hormone is secreted stimulating growth, particularly in children, and regeneration in the body. Deep sleep allows the brain to process and consolidate new information into the memory. In children and adolescents, poor sleep can negatively influence functioning and development. High-quality sleep occurs when the time to sleep, otherwise known as sleep latency, is short, and a portion of the night is spent in deep sleep.

Brain wave activity can tell us much about the quality of our sleep. Sleep onset occurs when the brain exhibits theta-waves, marking reduced consciousness. Delta-waves occur during the most restful deep sleep, which mainly occurs during the first half of the night. Rapid eye movement sleep, which also occurs during normal sleep, is characterized by a mix of alpha, beta and asynchronous waves.

Our sleep is also guided by hormones that dictate our circadian rhythm. Melatonin levels rise when light levels decrease, causing drowsiness and lowering body temperature, reaching a peak in the middle of the night.

The above information is based on scientific studies, and a list of the latest references is available on request.



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Quality for Life™ is the mark of **quality, reliability and traceability**. It means that DSM customers are getting the best ingredients, knowing the source on which they depend.

Quality for Life™ means **sustainability**. It symbolizes our commitment to our environment, consumers, our business partners, our people and the regulatory framework that governs our operations.

With the **Quality for Life™** seal, we aim to ensure **peace of mind for you and for your customers**.
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For more information on this Health Benefit Solution by DSM, please visit www.dsmnutritionalproducts.com, www.quali-blends.com or e-mail info.dnp@dsm.com

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