



Bluensee™ – Boost of mental focus and reduction of negative effects due to physiological stress response

Dr Sybille Buchwald-Werner, Vital Solutions GmbH

Stress and the Impact of stress on health >

More and more people experience stress and psychological trouble due to intensified lifestyle demands and an increasing workload. It may seem that there's nothing we can do about stress. The bills won't stop coming, there will never be more hours in the day and our career and family responsibilities will always be demanding. The American physiological association reported already in its "Stress in America" national report in 2010 that people recognize a continuous high stress level but they are too busy and lacking motivation to change their lifestyle to manage their stress better [1]. It seems like the stress has taken over control of their life and the missing willpower to change could be already a first sign of the development of a de-

pression, a development of a mental disorder. The world health organization (WHO) says that the state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community is a status of mental health. It is obvious that the status of mental health is at risk due to the current lifestyle of the society and therefore stress is a key health concern.

It is important to understand the causes of stress to be able to manage the types of stress, which can be influenced by each individual. On the other side it is even more important to learn how to cope with stress, which cannot be avoided. It is necessary to get back control of life to be able to deliver good performance

and to stay healthy. Stress has behavioural consequences which in excess could have physical consequences. Stressed people reported overeating, eating unhealthy foods and skipping meals. Many report sleeping irregularities, like lain awake at night and lack of physical exercise. Irritability and fatigue are the most common perceivable physical symptoms of stress. They are accompanied by a reduced ability to think, concentrate, remember, plan and organize and even to learn, reason and judge. Consequences of the reduced cognitive ability are that people do not feel comfortable and are challenged by everyday life. Reduced performance or irritated behaviour linked to emotions like exhaustion or anxiety worsens the overall situation.

Not surprisingly, consumers' demand for food supplements or functional beverages, which may help to maintain a normal cognitive function or to improve stress-reduced cognition, is rising. Mintel reported that particularly consumers at aged between 18 to 50 years are looking for brain health products. 32 % of these consumers take a supplement to improve brain function. In the consumer group between 18–24 years, people are most interested in memory enhancer (55 %) and mental focus (57 %) and they are preferably looking for functional beverages, shots or bars [2].

Prolonged stress results in a dysregulation of physiological systems, predominantly the nervous system, the endocrine and the immune system. For example stress induced unhealthy irregularities in sleep and eating habits support in combination with elevated stress hormone levels contribute to weight gain, particular abdominal obesity. There are different possibilities to measure stress. Well established method to measure stress or to investigate the changes in stress levels are validated questionnaire, stress-relevant biomarkers, like cortisol or physical parameter like blood flow and heart rate [3]. Cortisol

is a hormone showing increased concentration under stress. First insights report that elevated cortisol levels may be linked to craving for food with a preference for sweet foods. Higher carbohydrates intake as energy source leads to increased insulin release and consequently to more appetite, food intake and weight gain [4].

The body's response to stress directs blood flow from peripheral regions to vital organs like the heart. Long-term stress may consequently lead to malnutrition of the skin and accelerated skin aging. A vicious circle starts which can only be stopped by reducing stress. As today life style does not allow stopping stress totally, there is an increasing demand for natural ingredients, which are able to reduce stress-related hormone levels to support a healthy body weight and to prevent the long-term negative effects of stress on health. Long term elevated stress hormone levels may lead to inflammation and the development of degenerative diseases like diabetes, cardiovascular diseases or cognitive impairment. The onset of age related memory loss could be advanced by stress [5]. Today 62 % of consumers believe that supplements and/or functional foods/drinks can be effective in preventing and delaying normal age-related memory loss [2].

In combination with a healthy diet the intake of effective food supplements or functional foods may help to cope with stress and to reduce the negative effects of physiological stress response.

New product development for mental health > Vital Solutions develops innovative condition specific ingredients, which serve consumer demands for health prevention and help to reduce health care costs. The focus is on natural ingredients, which improve quality of human life by feeling good and ageing well based on a market-orientated dynamic strong R&D platform. The key element in people's quality of life is mental and



physical mobility; both needed to be happy and to live a full life, particularly during ageing. A healthy brain and a healthy gut are the key steering organs for digestion, metabolism and the generation of physical energy, mental energy, hormones and neurotransmitter which steer human vital functions like mobility, cognitive performance and mood. This is the reason, why Vital Solutions' research is focusing on digestive health, metabolism, brain health and anti-ageing.

Vital Solutions identified that consumers, female and male, are looking for ingredients, which help to cope with acute stress by maintaining or improving mental focus. Effects need to be perceived immediately because consumers want to take the ingredients on demand. Convenient applications besides beverages are food-like solid oral dosage forms like chewing gums or candies. Particularly for women the correlation between stress and weight management and stress and beauty is important. They are looking for ingredients, which help to reach and maintain a healthy body weight and which support particularly the reduction of abdominal fat and body circumference. Also for these ingredients a measurable effect is a must and as the success depends heavily on overall food intake and physical activity, it is important that the product concept includes an educa-

tion aspect helping people to adapt the overall lifestyle to their stress occurrence. Above the age of approximately 45 it becomes difficult to deny the signs of ageing which are becoming visible and one can recognize that consumers are getting more conscious about age-related degenerative diseases and factors which could accelerate their development. Consumers are vain and want to stay attractive. Attractiveness includes physical beauty and health. About 6 out of 10 consumers are concerned that they're likely to experience a major decline in brain function as they get older [2]. "Retaining mental sharpness as I age" is the No. 1 health concern consumers are extremely concerned about it followed by the demand to improve concentration and mood and to reduce feelings of stress/anxiety [2]. They start to look for supplements, which help to reduce long-term negative effects of stress, and as these are long-term effects without immediate, perceptible effect they are looking for food supplements which solid communicated scientific effects.

Based on these criteria Vital Solutions is developing innovative food ingredients for mental health addressing the key consumer demands.

An interesting plant for mental health is *Melissa officinalis*, an annual eatable herbaceous plant native to Europe. Common names are Lemon balm or Melisse. *Melissa officinalis* belongs to the mint family, Lamiaceae. Its traditional medical applications focus on the essential oil components of the plant and its application for relaxation. Leave preparation are applied as medical tea, alcoholic tincture or bath additives. In addition lemon balm has a long tradition as food, consumed as tea, spice or garnish. Sybille Buchwald-Werner, managing director at Vital Solutions GmbH, started her research on lemon balm many years ago. During this time she was employed at Cognis GmbH being head of the technical department for plant extract. A special lemon balm extract for

Fibregum™

mental health was developed and the beneficial effects on cognition and physiological stress response were investigated in two human studies in cooperation with Wild GmbH & Co. KG. Wild GmbH & Co. KG developed beverage and food formulation with lemon balm, which were also used as sample preparation for the human studies. A joint patent was filed and Vital Solutions is the licensee of this patent. Today there are several traditional herbal medicinal products on the market which promote lemon balm for its calming and relaxing effects. Modern research demonstrated new effects of lemon balm on mental health promoting cognitive effects [6, 7]. Several *in vitro* studies were carried out to understand the mode of action behind these effects and how they differentiate from the traditional calming effects. Studies showed that the traditional relaxing effects might be linked to elevated levels of the neurotransmitter GABA (γ -Aminobutyric acid) by inhibition of GABA-transaminase (GABA T), an enzyme which degrades GABA. Rosmarinic acid is described to be responsible for this effect [8]. The cognitive effects may be caused by several modes of actions. Well studied is the CNS cholinergic binding affinity to nicotinic and muscarinic receptors, which has shown to improve cognitive function, like memory improvement [9]. In addition the antioxidant protection provided by lemon balm shows promise in reducing oxidative-related brain cell death, which contribute to the development of degenerative diseases [10].

Lemon balm is not like lemon balm. Not all *Melissa officinalis* varieties contribute to the same effects. It seems like the traditional use of lemon balm for relaxation can be supported by all varieties. However beneficial effects on cognitive performance could not be confirmed for all investigated lemon balm varieties. Published human studies reported that extracts with the same phytochemical specification (standardization on rosmarinic



All-natural soluble fiber

- Excellent source of fiber
- Proven prebiotic benefits
- Exceptional digestive tolerance
- Low caloric value

Fi
Food ingredients Europe Visit us at booth 8H17
November 19-21

Fibregum™ line of products is an all-natural and GMO free source of 90% soluble dietary fiber from carefully selected acacia tree gum. **Fibregum™** is clean label and appeals to consumers because it's 100% vegetable origin and available in organic grades.

Clinical studies have demonstrated the numerous health benefits of **Fibregum™** and its prebiotic properties at a daily dose of 6-15 grams.

Fibregum™ is progressively fermented by probiotics in the intestinal tract without discomfort, making it the perfect replacement for other dietary fibers that consumers report can create gas, bloating and flatulence.

acid) obtained from different varieties did not show the same beneficial cognitive effects. *In vitro* studies confirm that not all extract exhibit the expected different CNS cholinergic receptor binding properties [11]. Therefore it is very important to use lemon balm preparation obtained from *Melisse officinalis* varieties, which are proven to have the targeted cognitive effects. It is required to fully control the supply chain for the selected plant variety. In addition suitable *in vitro* methods, so-called bioassays, to control the targeted receptor binding activities have to be established and applied during the selection of the raw material, the development of the production process and the set up of the specifications.

Bluenesse™ > Vital Solutions launched a proprietary *Melissa officinalis* extract, branded as Bluenesse™, which has beneficial effects to maintain and improve mental focus and to reduce long-term negative effects of physiological stress response.

Bluenesse™ is a proprietary *Melissa officinalis* leaf extract with a high content of rosmarinic acid, which is obtained by water extraction out of a special *Melissa officinalis* variety. Vital Solutions applied its innovative, fully bioassay-guided technology to produce the proprietary lemon balm extract, called Bluenesse™. All critical process points, from the selection of the raw material to the release of a batch are controlled



by the innovative bioassay-guided technology as well as by traditional phytochemical parameter.

The ingredient is scientifically substantiated with human studies. One pilot study to investigate the pharmacokinetic properties was carried out at RSSL Pharma in Reading, UK. Significant plasma levels were measured 30–60 minutes after intake. This indicated that the product is quickly absorbed and also confirmed results from the additional human study, where volunteers reported beneficial effects already 1 hour after intake. Bluenesse™ containing food products are suitable for consumers looking for products, which provide immediately perceptible cognitive effects on demand. A second pilot study was carried out, also by RSSL Pharma in Reading, UK to investigate if the extract is able to support cognitive performance. These positive results were then confirmed in a large human study, which was conducted by Prof. Scholey, Brain Science Institute, Swinburne University in Australia. Prof. Scholey is a world-known expert for brain health and has carried out several studies with lemon balm. The aim of the study was to evaluate the effects of the lemon balm extract on mild stress and stress-related parameters. The investigation did include parameter to evaluate cognitive performance, physiological reaction of stress and mood. It was a double blind, randomized, placebo-controlled, balanced-crossover, monocentric study, including 25 healthy people, aged 18–39, 8 male and 17 female, all non-smokers. The stress was induced by a multi-tasking activity, called purple framework battery (defined intensity stress simulator, DISS). Study products did include a beverage and a fruit bar. Lemon balm extract was tested in concentration of 300 mg and 600 mg. Study results demonstrated that the intake of 300 mg lemon balm extract per day showed the strongest effects. Already 1 hour after intake significant beneficial effects could be determined related to improvement of alertness, working mem-

ory and word recall, reduction of cortisol as marker for stress and reduced anxiety. Effects were still measurable 3 hours after intake.

Most of the available anxiety reducing agents have a strong calming effect, which reduce cognitive ability and can even have a sleeping aid function. Lemon balm has an outstanding ability to support calmness, which can be best described as a status of mental focus in combination with being highly alert. This is a perfect physiological basis to cope with stress in order to be able to deliver a good performance and to stay healthy.

Summary Bluenesse™ > Bluenesse™ is an innovative food ingredient and the answer to consumer demands for ingredients with beneficial physiological effects for mental health, which support mental focus and reduce the long-term negative physiological effects of stress for overall health. It uniquely combines calming and alertness increasing effects providing the ability to deal with complex situations, from high work load to family issues, in a cool-headed, focused and structured way. Bluenesse™ contributes to overall quality of life. It is a high quality, sustainable, natural food ingredient, which is IP protected and approved to be used in dietary supplements and foods in Europe and the U.S.

References >

- [1] Stress in America™ national report, American physiological association, 2010
<http://www.apa.org/news/press/releases/stress/national-report.pdf>
- [2] Market data summary by Sloan Trends Incorporated
Getting Ahead of the Curve: Mental Performance & Brain Health, 2010
<http://beta.rodpub.com/uploads/May%2010.pdf>
- [3] Quantifying stress damping and stress protective effects of foods, J. Hellhammer et

al, AgroFOOD Industry hi-tech, 2010

- [4] Stress may add bite to appetite in women: a laboratory study of stress-induced cortisol and eating behavior, E. Epel et al, Psychoneuroendocrinology, 2001
- [5] University of Maryland, Medical center, Education Report, Stress
<http://umm.edu/health/medical/reports/articles/stress>
- [6] Modulation of mood and cognitive performance following acute administration of *Melisse officinalis* (lemon balm), D.O. Kennedy et al, Pharmacology, Biochemistry and Behavior, 2002
- [7] Modulation of mood and cognitive performance following acute administration of single dosage *Melisse officinalis* (lemon balm) with human CNS nicotinic and Muscarinic receptor-binding properties, D.O. Kennedy et al, Neuropsychopharmacology, 2003
- [8] Bioassay-guided fractionation of lemon balm (*Melissa officinalis* L.) using an *in vitro* measure of GABA transaminase activity, R. Awad et al, Phytotherapy Research, 2009
- [9] CNS acetylcholine receptor activity in European medicinal plants traditionally used to improve failing memory, G. Wake, J. of Ethno-Pharmacology, 2000
- [10] Phenolic antioxidants attenuate neuronal cell death following uptake of oxidized low-density lipoprotein, H. Schroeter, Free Radical Biological Medicine, 2000
- [11] The psychopharmacology of European herbs with cognitive-enhancing properties, D.O. Kennedy et al, Current pharmaceutical design, 2008

*The Author: Dr Sybille Buchwald-Werner,
Founder and managing director of
Vital Solutions GmbH
For further information, please contact:
Sybille.Buchwald-Werner@vitalsolutions.biz
For further information, please contact:
Vital Solutions GmbH
Hausinger Str. 6
40764 Langenfeld, Germany
info@vitalsolutions.biz
www.vitalsolutions.biz*