

# GABA FUNCTIONAL INGREDIENT

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**L**et me explain a little about the effect of GABA and the role of functional foods in general, and their contribution to improving people's lives and the society before getting into the technical side of GABA production.

Food provides essentially three functions to us. First function is "nutrition". Its role is to provide some of the seven nutrients, including energy, minerals, fat, and vitamins in order to sustain life. The second function is "taste" that promotes appetite; good taste and flavour make eating a satisfying experience and help enhance the feeling of happiness and improve life. Third is "health" that affects our bodies functions, such as immunity improvement, disease prevention, symptom alleviation, health maintenance, etc.

These three major functions of food were first theorised by Japanese scientists in the 60's and then later embraced in Western countries. Presently, this theory is widely known, in particular, the third function, which is further being studied through basic research for various applications in many countries.

Various functional foods are developed and sold also in Japan. For example, numerous functional food products have been developed to help suppress elevated blood pressure, prevent or alleviate menopausal disorders, improve sleep, and beauty effects. One of the well-known functional foods in this category is the germinated brown rice/GABA rinse-free rice, enriched with GABA.

## GABA: Gamma-aminobutyric acid

GABA is a type of active natural ingredient in which glutamic acid is produced by the action of decarboxylases. A type of non-proteinaceous amino acid that is found abundantly in animals and vegetables, especially in the brain of animals and germ of plants. Also, when a vegetable breaks dormancy and begins to germinate, GABA is produced to sustain its life.

In the early 50's, scientists found that mammalian brain nerve tissues had a large amount of Glutamic acid, Aspartic acid, and  $\gamma$ -aminobutyric acid, the amino acid components of the three glutamic acid systems. Subsequent studies have shown that glutamate and  $\gamma$ -aminobutyric acid act as promoters and suppressors, respectively, of neuronal signaling processes in the brain, which function to prevent the breakdown of the nervous system and play the important roles of neurotransmitters.

Presently, they are widely used as a drug for the treatment of brain metabolism such as epilepsy, Parkinson's disease (PD), cerebral blood flow improvement, and brain trauma recovery.

Recent studies have shown that GABA acts to suppress the

activity at the cranial nerve origin, prevents overheating of nerve cells and irritating related information from reaching brain centers, thereby basically sedating nerves. Additionally, it is recognised that ingestion of GABA improves the activation of glucose phosphatase, activity of the brain cells, metabolism of brain tissue, and recovery of brain cell function and nerve function. GABA is therapeutically effective for symptoms caused by cerebrovascular disorders.

Furthermore, improvement of kidney and liver functions and diet function was also observed, although these effects should be further investigated for more evidence. GABA is used worldwide as a drug to promote cerebral metabolism. In various cases, the daily dose is generally given orally; three-grammes split into three doses.

If the continual daily intake of GABA between 26.4 and 64.2 milligrammes (mg) can be maintained, it may be effective in relieving or improving symptoms associated with sleep disorder and autonomic neuropathy, in other words, it would be beneficial to consume functional foods with adequate pharmacology dose of the functional ingredient, on a daily basis. Benefits are generally felt after about four weeks of continual daily ingestion.

Many foods around us contain GABA. For example, vegetables, fruits, miso, soy sauce, fermented foods, etc. In a Japanese diet, it is believed that 100mg of GABA is consumed daily from regular meals. Since the amount of fermented foods in the diet of Chinese population is smaller than that of Japanese, their GABA intake equivalent may be lower, although it is considered higher than that of many other countries.

## Role of functional foods

The functional foods cannot be prescribed for therapeutic purposes since their GABA content is too low for an effective treatment. However, in many cases, long-term eating of functional foods may alleviate symptoms of diseases that do not respond effectively to treatment with drugs.

The functional food imparts a fine-tuning effect to the human body, but it is a continuous process, as an old saying, "90cm thick ice on the river is not a result of one cold day" reminds us. Common lifestyle-related diseases develop as a result of the cumulative effects amplified over time.

If the malfunction of the body can be adjusted when it is "minor", its deterioration may be minimised. If "prevention of disease" can be the main focus, "cure of disease" may not be an issue because the disease would be prevented. Consequently, no disease, which means no distress for the patient to deal with, economic losses can be avoided, and the burden on the household and society would be reduced.

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