

Amino acids unlock sports performance

The founder of Ajinomoto Co., Inc. used amino acids to revolutionize our understanding of flavour, but they can also be absorbed rapidly to help build muscle and enhance recovery. Today, **AJINOMOTO CO., INC. IS CONDUCTING PIONEERING RESEARCH** into their uses in supporting sports performance.

It may come as a surprise to learn that a company that built their reputation on food seasonings is also leading the way in sports nutrition. However, there is a vital connection between seasonings and sports nutrition — amino acids — and Ajinomoto is a world leader in their research.

Amino acids are known as the building blocks of life. When strung together, they form the proteins that account for 20% of our body mass, including key components within our muscles. Remarkably, the more than 100,000 proteins in the human body are made from combinations of a mere 20 amino acids. In nutrition, amino acids both impart flavour to food and are essential for muscle growth and recovery.

An authority on amino acids Ajinomoto's expertise in amino acids extends back more than a century. The company was founded in 1909, a year after chemist Kikunae Ikeda discovered that an amino acid, glutamate, is a key component of the Japanese soup stock *dashi*, imparting it with its umami flavor.

Mid-way through the century the company began

to consider the potential of amino acids as nutrition supplements for athletes, following some prior use in clinical nutrition. Ajinomoto soon found that after exercise amino acid levels in high performance athletes dropped, so much so that the physical condition of the athletes resembled that of medical patients. "Amino acids are depleted during vigorous exercise and this causes an athlete's physical condition to drop off," explains Yasufumi Furuhashi, section manager at Ajinomoto's Institute of Food Science and Technologies. Today, says Furuhashi, their amino acid sports supplements can help alleviate this problem. Moreover, these supplements can be absorbed within half an hour, while the digestive system takes 3 to 4 hours to fully extract amino acids from food.

Ajinomoto started retailing its first sports supplement in 1995, and today it offers a wide range of products for sports people of all levels.

Signals that help build muscle and reduce fatigue

Ajinomoto has grown into a global force due to its long-standing commitment

to research, both in-house and through collaborations with scientists at external institutions (see the following pages for an example of such a project). For example, more than a century of collaborative research has gone into the muscle-building amino acid leucine, an essential amino acid that cannot be synthesized *de novo* (or from scratch) within the body. The fruits of this research are evident today in Ajinomoto's leucine-enriched essential amino acid mixtures.

Intense exercise causes muscle damage, which can bring on a feeling of muscular stiffness. The body uses all 20 amino acids to repair such damage. However, research has shown that amino acids are not only building blocks for muscle proteins — leucine also acts as a chemical signal for the synthesis of these proteins. This dual role makes leucine a vital ingredient for building muscle and promoting recovery from muscle fatigue.

Fine-tuning athletic performance

As well as researching amino acids in the lab, Ajinomoto is actively engaging the sports

community. Today, they are introducing their products to top athletes through the Ajinomoto National Training Center in Tokyo (right). Here, athletes receive expert advice about optimal diets and eat meals and supplements prepared by registered dietitians.

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A careful combination of diet and amino acid-based supplements can really help to fine-tune physical condition, agrees Japanese Olympian Takeshi Matsuda (far right, top). At age 32, Matsuda was already a veteran swimmer when he won a medal in the 2016 Olympic Games, his fourth time as an Olympic contestant and medallist. "I was consciously looking for things I could do to improve my performance other than doing more training," he says. "Ajinomoto provided me



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with their amino acid-related products as well as advice from professional support team members, which has been a huge help in assisting me to compete in great condition."

Ajinomoto's guiding philosophy is succinctly summed up in its slogan, 'Eat Well, Live Well'. It expresses the belief that a diet that is both tasty and healthy will empower people to perform to the best of their abilities. When applied to sports people, this philosophy finds expression in the Japanese phrase *Kachi-meshi*, which translates as "Winning Meals" and is the name of Ajinomoto's sports nutrition meal program.

The first question the *Kachi-meshi* program asks is not "What should I eat?" but "What do I want to achieve through my diet?" explains Hirohisa Uchida, group manager of Ajinomoto's Sports Nutrition Department. "Different athletes

have different answers to that question." He says some want to increase their body weight, while others want to reduce it. "Most want to build up their muscles. Without first considering the goals of an athlete, it is not possible to come up with an optimized diet."

Nutrients usually provide individuals with three fundamental benefits: they give the energy needed to physically compete, help build muscle and aid in the maintenance of peak physical condition. *Kachi-meshi* seeks to address all three areas for elite athletes by stressing the importance of regular food intake during the day (*Kachi-meshi* meals), enhanced by sports supplements taken at strategic times (*Kachi-meshi* supplements).

"The improvement of competitiveness in sports is

achieved by avoiding poor physical condition or over-training," says Masaaki Sugita, a professor in exercise physiology at Nippon Sport Science University. "This is possible by visualizing an athlete's physical condition objectively, planning physical recovery scientifically through meals and sleep, and utilizing various scientific tools during training."

Ajinomoto agrees and argues that athletes can significantly improve their body's condition by optimizing their diets and the timing of when they consume meals and supplements.

Future of amino acids

In 2016 Ajinomoto became an official partner of the Japanese Olympic Committee, who are preparing for the 2020 Tokyo Olympic Games. The Ajinomoto Victory Project will use food and amino acid technology to give Japanese

athletes an edge and help boost their medal count at the next Olympic Games.

"Since just a slight difference in performance can affect the outcome of a sports event, just making a small improvement to an athlete's condition can have very significant results," says Uchida. Ajinomoto's vision for amino acids however is broad, and they will continue to research amino acid use for all levels of sports participant, as well as find ways to improve the average person's health and physical function in a variety of situations.

"We stress the important role that amino acids play and how they can be harnessed to help people from Olympic athletes to sports lovers," says Furuhashi. "Amino acids can benefit everyone." ■

Eat Well, Live Well.
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