Details of Technology



Name of Technology	Suppression of muscle atrophy by food components	Life Science
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Key words	aging, bed rest, diseases, muscle, amino acids	

What kind of technology is this?



An active society requires active human bodies (muscles). It is important to eat the foods each day needed to prevent muscle weakness and atrophy by aging and decreases.

In this aging society, it is important to maintain lively social activity by maintaining an active body, that is, maintaining the amount of muscle needed for active moving. Especially in conditions of limited muscle movement such as the bedridden state, the muscular mass is drastically decreased (muscular atrophy and sarcopenia) and many health problems such as delayed disease recovery are induced.

We demonstrated that dietary protein and amino acids stimulate muscular protein synthesis and inhibit muscle degradation. Protein in the diet and amino acids, especially branched-chain amino acids, can suppress the progression of muscular atrophy in a low nutrition condition and disuse muscular atrophy (in a bedridden subject). In the present research, we will examine the effect of not only dietary protein and amino acids but also other food components on synthesis and degradation of muscular protein and estimate the required amount and the intake timing.

We will further apply our findings to develop foods containing these components.



Time after administration of leucine

Changes in skeletal muscular protein synthesis and degradation rates after administration of a branched-chain amino acid (leucine)

What are its applications?

This technology should be applicable to the preparation of nutritious supplements for aged people, nutritious food orally ingested after surgery and supplements at time of exercise.

Related patents	Japanese Patent Laid-Open No. 2003-55253
Related materials	Amino Acids. (2009) in press J.Nutr. Sci. Vitaminol. 53: 552-555 (2007). J.Nutr. Sci. Vitaminol. 50: 227-230 (2004). J.Nutr. Biochem. 13: 121-127 (2002).