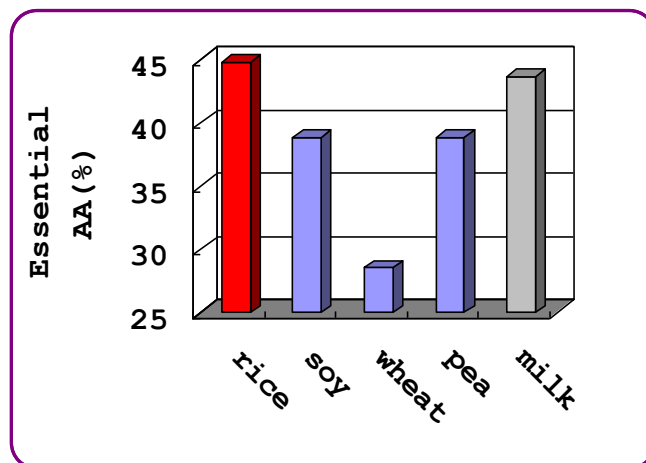


ORYZA PROTEIN-P70

ORYZA PROTEIN is a **rice protein powder** with a high content and rice protein is widely known as **unique** and **hypoallergenic** protein source. Raw material of ORYZA PROTEIN is **non-GMO** rice, so you can feel **safe** to apply it into your product. Furthermore, ORYZA PROTEIN has nutritional and functional benefits as below. ORYZA PROTEIN brings great healthy benefits to you and your customer.

Nutrient Value

Essential amino acids content is similar to milk protein and **even higher than three plant proteins**.¹⁾ Some reports suggested fortifying rice protein with lysine and threonine to make rice protein more attractive although rice protein is rich in methionine and cysteine.²⁾ **We highly recommend rice protein as an excellent protein source.**



Hypoallergenicity

It is well known that various allergens exist in food materials and egg, milk, wheat, buckwheat, peanut, shrimp and crab must have been showed on product packaging in Japan in case ingredients derived from such raw materials are included in products. In fact, some reports said that rice protein includes some allergens and 16-kDa rice protein is one of the major allergens.^{3,4)} However, Yamada, C. *et al.* report that **less 14-16 kDa rice allergen is absorbed in the small intestine**.⁵⁾

Furthermore rice protein seems to be considered hypoallergenic because of lack of gluten.²⁾ Therefore **we consider rice protein as safe.**

**Lowering
cholesterol and TG**

Rice protein also has some great functional benefits. Yang, L. *et al.* reported that **there was a significant decrease in the plasma cholesterol level and a lowering tendency in the plasma triglyceride level** when rice protein is orally administered in the adult mice **as compared to casein.** And **the effects is similar to soy protein isolate** (Table 1).⁶⁾ The same effects are reported in another paper.⁷⁾ Therefore **we consider rice protein as beneficial ingredient for metabolic syndrome.**

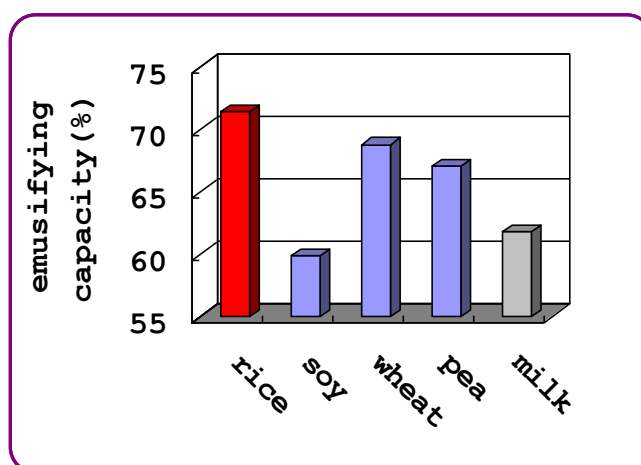
Table 1 Plasma lipids concentrations in adult rats fed different protein diets

	casein	Soy protein isolate	Rice protein
Total cholesterol (mg/dL)	61.6 ± 7.9	46.2 ± 1.4	47.7 ± 3.0
HDL cholesterol (mg/dL)	37.8 ± 4.0	30.0 ± 1.8	39.1 ± 2.3
Triglyceride (mg/dL)	43.2 ± 7.5	33.5 ± 3.4	34.3 ± 4.1

Reference: Yang, L. *et al.*, *Biosci. Biotechnol. Biochem.*, **71**, 694-703, 2007

**Emulsifying
capacity**

ORYZA PROTEIN has fine emulsifying capacity. The capacity of ORYZA PROTEIN is stronger than the one of soy protein and **is the strongest among five typical proteins.** ORYZA PROTEIN can make your products more unique and special.



Method : 0.45 g of each protein and 15 mL of distilled water are mixed and then homogenized at 6,500 rpm, for 3 min, at RT. After adding 15 mL of rice bran oil, samples are homogenized again at 17,500 rpm, for 5 min, at RT. 10 mL of samples were collected and then centrifuged

at 1,500 rpm, for 5 min, at RT. Emulsifying capacity is calculated according to the following calculating formula.

Emulsifying capacity (%) = the emulsifying layer volume/ the total volume *100



Other functional effects

Ishii, K. et al. suggested that **the bread diet may promote fat synthesis / accumulation compared with the rice diet.**⁹⁾ Moreover, **the effect of rice protein on bone growth is reported.**¹⁰⁾ Chen JR. et al. reported that rice protein had positive effects on either tibial bone mineral density (BMD) or bone mineral content (BMC) relative to casein.

- 1) Japan food amino acid profiles (1986, MEXT)
- 2) Koo WW. et al., *Minerva Pediatr.*, **59**, 35-41, 2007
- 3) Urisu, A. et al., *Int. Arch. Allergy Appl. Immunol.*, **96**, 244-252, 1991
- 4) Shibasaki, M. et al., *J. Allergy Clin. Immunol.*, **64**, 259-265, 1979
- 5) Yamada, C. et al., *Biosci. Biotechnol. Biochem.*, **70**, 1890-1897, 2006
- 6) Yang, L. et al., *Biosci. Biotechnol. Biochem.*, **71**, 694-703, 2007
- 7) Morita, T. et al., *J. of food science*, 58, 1393-1406, 1993
- 8) Ishii, K. et al., *J. Nutr. Sci. Vitaminol*, **51**, 349-354, 2005
- 9) Chen JR. et al., *Exp. Biol. Med.*, **233**, 1348-1358, 2008

Safety

Melamine	Not detected
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Specification

Appearance	Light brown powder. Light unique smell.
Protein (Dry basis)	> 70 %
Loss on Drying	< 10 %
Heavy metals	< 20 ppm
Arsenic	< 2 ppm
Standard Plate Counts	< 5,000 cfu/g
Moulds and Yeasts	< 100 cfu/g
Coliforms	negative

ORYZA OIL & FAT CHEMICAL CO., LTD.
 striving for the development of the new functional food materials to promote health and general well-being.

From product planning to OEM - For any additional information or assistance, please contact:

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