

Application note PrOatein general information

Lantmännen's PrOatein oat protein is a natural, clean label, non-GMO protein containing 55% protein. It can be used in food formulations to increase the nutritional content of the final product having a minimum impact on the rheological characteristics of the formulation.



General characteristics

- Appearance, taste, and aroma: PrOatein is a beige, cereal tasting powder with an oaty flavour that integrates easily into food recipes.
- Declaration: Oat protein.
- Shelf life: 18 months after production date.

Nutritional aspects

- Average protein content: 55%
- PDCAA's: 0.67
- Oat protein digestibility: 91%
- Amino acid composition:



Figure: amino acid composition of PrOatein Oat Protein, in milligrams of amino acid per gram of protein.



Table: Amino acid composition of PrOatein Oat Protein

Component	% (g/100g ingredient) °	mg/g of protein
Protein	52.80	
Aspartic acid ^a	3.50	66.00
Threonine*	1.40	27.00
Serine	1.80	34.00
Glutamic acid ª	10.40	197.00
Proline	2.40	46.00
Glycine	1.70	31.00
Alanine	1.80	35.00
Valine*	2.50	48.00
Isoleucine*	1.90	37.00
Leucine*	3.70	70.00
Tyrosine*	3.70	70.00
Phenylalanine*	2.70	52.00
Lysine*	1.60	30.00
Histidine*	1.10	20.00
Arginine*	3.40	64.00
Cysteine*	1.00	19.00
Methionine*	0.90	17.00
Tryptophan*	0.70	13.00

Total

100.00/99.00

* Essential (indispensable) aminoacids

^a The following assays were run at Medallion Laboratories (Minneapolis, MN, USA) using validated AOAC Official Method 994.12 for amino acids – acid hydrolysed amino acid profile, tryptophan, cysteine and methioninem and total protein by Dumas using AOAC method 992.15 and 6.25 factor for total nitrogen. Aspartic acid result includes asparagine and glutamic acid includes glutamine. Hydroxyproline was non-detectable. b Amino Acid content is expressed as mg/g protein for assessment of nutritional quality.

General guidelines

- Wettability: PrOatein is a free-flowing powder with good wettability that does not stick or create lumps when added to liquids.
- Protein's functionality:
 - The main functionality of PrOatein is to increase the nutritional content in food products.
 - Solubility: oat proteins generally have low solubility at pH between 4 and 7. Consequently, they are easier to use in solid foods (cookies, bread, pasta, protein bars etc.) than in liquid foods. There is, however, high interest in using oat protein in liquid formulation due to the popularity of oat in, for example, dairy alternatives. In that type of applications, mechanical treatments (high pressure homogenisation) and small inclusion levels are recommended in order to diminish undesired effects of having proteins with low solubility. Dispersing the protein powder in the liquid phase at 85°C prior to the high-pressure homogenisation treatment makes it more effective.
 - Emulsifier in formulations of low-fat content, such as plant-based beverages.
 - PrOatein contributes to foam formation, but the combination with a stabiliser, such as Promoat Oat beta-glucan is recommended.
 - \circ $\,$ Water holding capacity: 2.07 g of water per gram of PrOatein.
 - Viscosity: PrOatein has little impact on viscosity. Gelling is observed over 20% inclusion levels.
- Temperature: changes in temperature during production have little effect on its stability.
- pH: in general, changes in pH do not have great effect on PrOatein. In liquid formulations, however, the stability is increased at pH 7 to 7.5 (higher stability, smaller particle size and decreased sedimentation)

