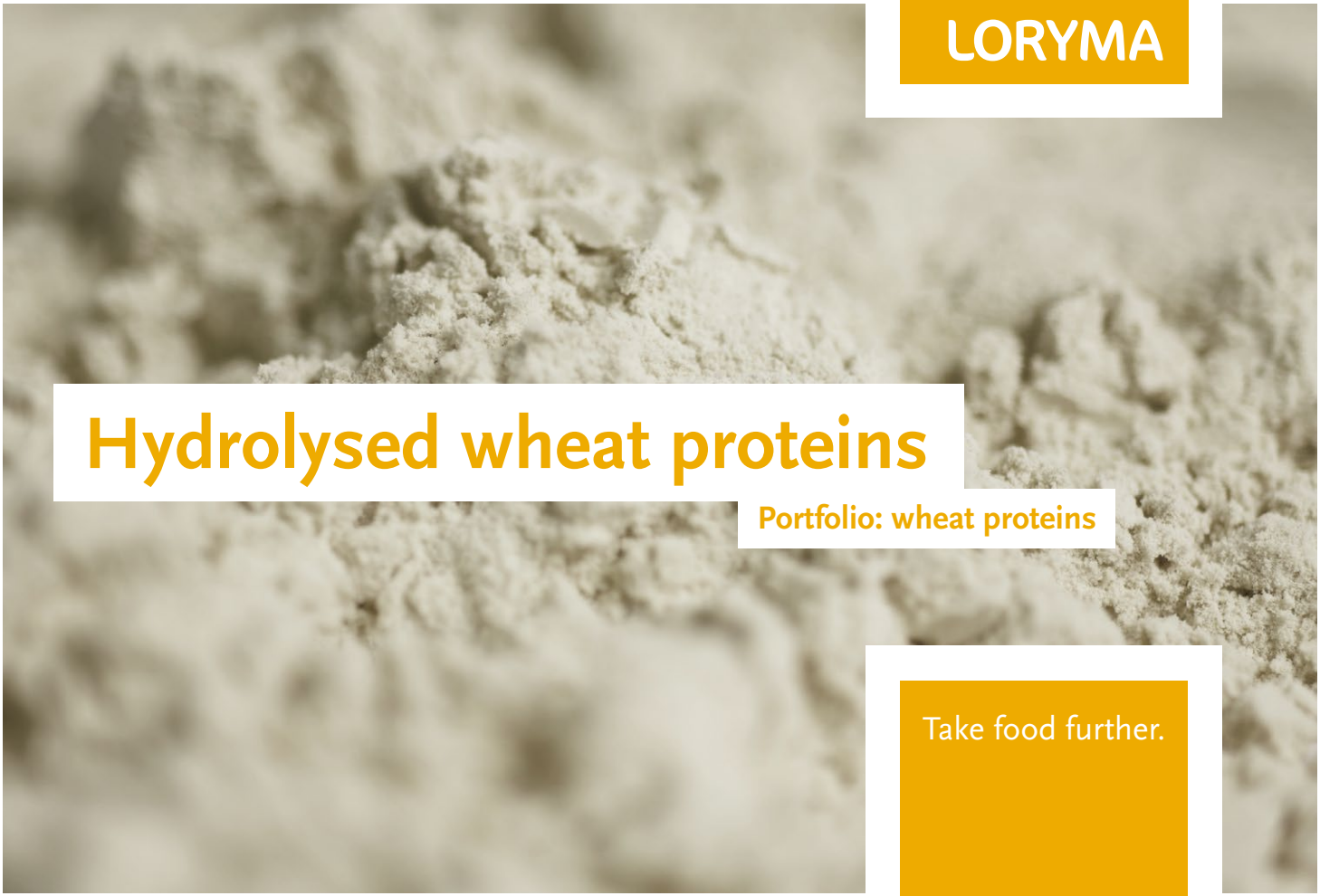


LORYMA

Hydrolysed wheat proteins

Portfolio: wheat proteins

Take food further.

Hydrolysed wheat proteins: functional ingredients and a high-quality source of nutrients

As a vegetable protein source, hydrolysed wheat protein not only improves the nutritional profile of sports nutrition – Lory® Protein H11 and H12 can also increase the protein content in product groups outside the sports nutrition segment. ‘High Protein’ is a growing trend. For instance: protein-rich baked goods as well as nutritionally-optimised plant-based alternatives are in high demand among health-conscious consumers.

Soluble wheat protein optimises both the physiological nutritional profile, as well as other product characteristics such as texture and processing. The functional properties result from the gentle enzymatic hydrolysis of vital wheat protein. The protein powder is easy to dose and forms a homogeneous dispersion in water, making it ideal for application in a wide range of foods.

General properties and benefits of Lory® Protein

- Broken down vegetable protein
- Good sensory properties
- Contains valuable amino acids
- High glutamine content
- Easy handling and simple dosing
- Good digestibility
- Nutritional profile can be enhanced by combining with other protein sources
- Good dispersing properties

Properties and benefits of Lory® Protein H11

- Neutral taste
- Forms a homogeneous dispersion with low viscosity in water
- Low foam formation
- Heat- and pH-stable

Application examples of Lory® Protein H11:

- Optimised baked goods, e.g. bread, pastries and patisseries like biscuits, shortbread, muffins etc.
- Protein and muesli bars
- Protein shakes
- Injection brines for meat applications

Properties and benefits of Lory® Protein H12

- Unobtrusive, slightly acidic taste
- Light colour
- Medium emulsion capacity
- Medium foam formation

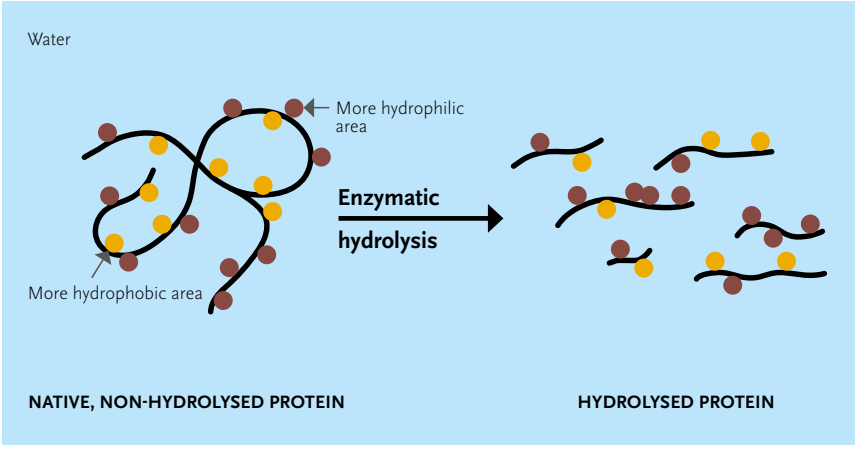
Areas of application of Lory® Protein H12

- Protein enrichment of plant-based meat alternatives, e.g. boiled sausage, bacon
- Protein enrichment of plant-based fish alternatives, e.g. salmon
- Protein enrichment of hybrid products, e.g. wet-cured ham

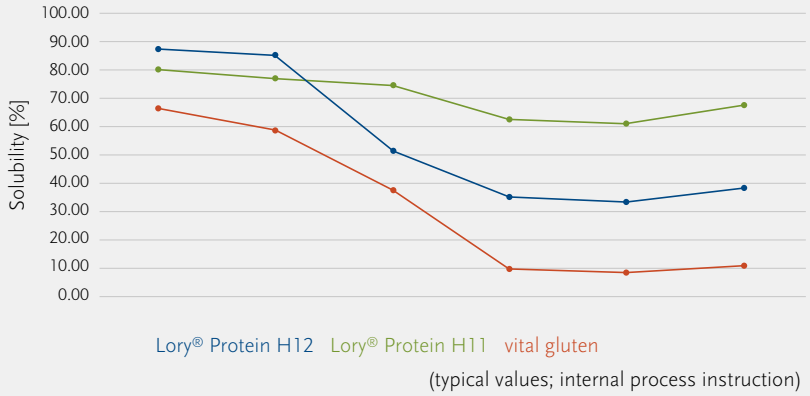
Functionality water solubility

Solubility in water: the difference between vital and hydrolysed wheat protein. Vital wheat protein (gluten) primarily comprises protein fractions of glutenin and gliadin, which form a dough on contact with water or with mechanical action (kneading). Due to the formation of such water-repellent agglomerates, which give doughs a viscoelastic structure, gluten is also called gluten. Enzymatic hydrolysis shortens the molecular chains, preventing agglomerates from forming.

The polar amino acid residues of the hydrolysed wheat protein can be well hydrated, which opens up other areas of application than for gluten.



Solubility [% dry substance] depending on pH value



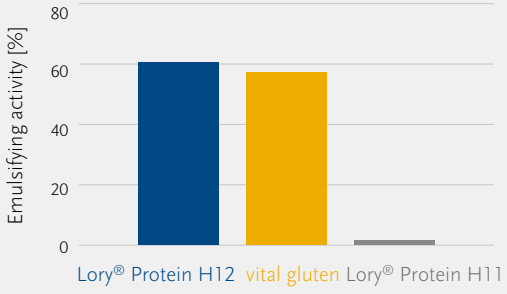
(typical values; internal process instruction)

- Hydrolysates are fundamentally better soluble than vital gluten
- Lory® Protein H11 has a good solubility across all pH ranges of at least 60 %.
- At a pH value < 4, Lory® Protein H12 is more soluble than Lory® Protein H11

Functionality Emulsification

- Proteins can stabilise emulsions by attaching themselves to the interfaces between oil and water
- The molecule size is crucial here: molecules that are too large are often too inflexible to ensure a stable interaction. On the other hand, with molecules that are too small, these forces are not strong enough.
- Lory® Protein H11 is so strongly hydrolysed that it has no appreciable influence on the formation of emulsions.

Emulsifying activity at pH = 6.2



Other Functionalities

	Vital gluten	Lory® Protein H11	Lory® Protein H12
pH stability	pH reduction changed at high pH values	pH stable	Denatures the properties
Heat stability	Denatured when exposed to heat	Heat-stable	Denatured when exposed to heat
Gelation	Forms strong gels	No gelation	Weak gelation
Emulsion	Medium emulsion activity but difficult to disperse	Weak emulsion activity	Medium emulsion activity
Foam formation	Medium foam formation, but difficult to disperse	Weak foam formation	Medium foam formation


Lory® Protein:
diversity in application

Application area number 1:

Plant-based Mortadella

Thanks to the Lory® Bind wheat-based binding component, the vegan sausage patty has an elastic and firm texture.
And, thanks to its enrichment with hydrolysed wheat protein (Lory® Protein H12), it has a similar protein content to classic meat cold cuts. Optional additions such as bell peppers or mushrooms can be used. The mouthfeel is very similar to that of the animal-based original, yet the sausage alternative has significantly less fat, is low in sugar and contains additional fibre.

Benefits:

- Protein content up to 12 % (comparable with the classic Mortadella sausage)
- Authentic mouthfeel with a firm, non-rubbery bite
- The plant-based alternative's colour shades are adjustable, as Lory Protein H12 is a light-coloured protein
- Production analogous to the classic cutter process

You can find more information on our hydrolysed wheat proteins under the adjacent link:

Application area number 2:

Baked goods

Depending on the application, the hydrolysed wheat protein can be used primarily as an additional source of protein or to optimise doughs.

Follow the QR code to our video about Lory® Starch Elara and Lory® Protein.

Possible applications for the protein enrichment of baked goods

Lory® Protein is ideally suited for the production of nutritionally optimised high-protein/low-carb baked goods such as muffins, biscuits, sponge cakes, wafers or crackers. The ingredient interacts only minimally with the dough, so the other product properties such as texture are not affected.

Benefits:

- Increased protein content with the same texture
- Functional added value: in baked goods containing wheat flour, with no additional allergens/e-numbers declaration
- Easy processing

Possible applications for improving dough properties

Particularly in yeast-raised or drawn doughs such as biscuits, flaky and puff pastry as well as pizza doughs, Lory® Protein H11 can be used as a functional ingredient that has a positive effect on the dough properties. The wheat proteins interact with the gluten in wheat doughs and relax the dough. In many cases, this can improve machinability and thus increase production efficiency.

Benefits:

- ‘Reduced elasticity (less ‘snapping back’ of the dough)’
- Improved machinability
- Functional added value: in baked goods containing wheat flour, with no additional allergens/e-numbers declaration
- Easy processing
- Optimised nutritional profile

Application area number 3:

Protein bars and muesli protein bars

For the manufacture of sports snacks where a high protein content is desirable, Lory® Protein H11 with a protein content of over 82.3 % is recommended. In both the classic protein bar with a soft core and for the 'crunchy' variant with grains, extruded pops or flakes, this soluble wheat protein can be used in larger quantities.

Benefits:

- High protein content (< 82.3%, N x 6.25)
- Easy, homogeneous incorporation into the base mass
- Processability even at high temperatures (baking)
- Contains valuable amino acids, especially glutamine (a complete amino acid profile can be achieved by supplementing lysine)

Application area number 4:

Protein shakes

Due to its high solubility in water and low foam formation, Lory® Protein H11 is optimally suited for use in beverages and instant drinks. The hydrolysed proteins influence the nutritional profile of the application by adding valuable amino acids and significantly increasing the protein content – properties that are particularly in demand in the fitness and sports nutrition segment.

Benefits:

- High protein content (< 82.3 %, N x 6.25)
- Good dispersibility
- Low increase in viscosity in the application
- Contains valuable amino acids, especially glutamine (a complete amino acid profile can be achieved by supplementing lysine)
- Low foam formation

Application area number 5:

Injection brine

Along with specialist starches and flours, hydrolysed wheat proteins are a constituent part of Lory® Inject injection brines which prevent the meat from becoming dry and tough during processing.
The functional properties of the hydrolysed wheat proteins not only have a positive effect on the nutritional value of the end-consumer product, they also offer definitive benefits in the productions process: there is no loss of pressure in the injector as a result of foam formation, and the homogeneity of the brine ensures uniform treatment.

Benefits:

- Nutritional optimisation through the addition of plant-based protein
- Neutral taste
- Homogeneous dispersion, low sedimentation
- No clumping
- Low foam behaviour and therefore no pressure loss in the injector

Click on the link below for our product video with detailed information about our Lory® Inject brine additives:

Greater quality, performance and cost-effectiveness for your products

We have served as a reliable partner to the food industry for over 40 years. With our innovative solutions, we support you in optimising your products in terms of texture, quality and flavour, and in developing new food concepts in line with future trends. With certified quality and safety. With in-depth industry knowledge and a wealth of expertise in the field of industrial food production. **Loryma. Take food further.**

CRESPEL & DEITERS
GROUP

Loryma GmbH
Am Falltor 3, 64673 Zwingenberg, Germany
T +49 6251 1799-0, F +49 6251 73964
loryma@crespeldeitersgroup.com
www.loryma.de