Animal protein processing with microbial enzymes

Boost your efficiency and sustainability.
It's good for the planet — and for your bottom line
Rising population and growing demand for proteins

- The world’s population is expected to grow to nearly 10 billion by 2050.
- Proteins are vital for human health, yet production of them can put a strain on land and water use.
- Traditional meat-based proteins won’t be able to feed a hungry planet.
- There is a need for better use of animal proteins, as well as increased production of alternative protein sources.

– The Meat Site
Protein ingredients market size including plant protein and animal/dairy protein, was valued at $38 billion in 2019, and is forecasted to experience a 9.1% CAGR from 2020 to 2027.

– Grand View Research
Global food trends

More protein

• The demand for more proteins is a global megatrend, with more consumers seeking for protein rich diets.

Waste not

• Almost a one-third of the food produced in the world is wasted. Using more of this wasted food offers a great opportunity for innovation. Exploiting previously discarded co-products from meat and fish processing, is key for sustainable production.

Time is of the essence

• Busier lifestyles are a challenge to meeting nutritional requirements. Protein-rich snacks to eat on-the-go are gaining ground.

Affordability

• Low-income consumers make up a large part of the global consumer base, particularly in emerging markets. Affordability is an important topic for the food and beverage industry.
What are enzymes?

- They speed up vital natural processes
- They are pure proteins
- They are catalysts, speeding up biochemical reactions
- They are present in all living cells
- They are fully biodegradable
- They make everyday products more sustainable
Enzymatic hydrolysis are a natural and environmentally friendly processing aid that improves the properties of proteins to make them more suitable or easier to use, and effectively extracts valuable ingredients from animal co-products.

Extract valuable ingredients form animal co-products with microbial enzymes, while improving the environmental footprint

- Extract valuable nutrients and compounds from animal co-products
- Produce flavor generation extracts from animal co-products
- Improve the environmental footprint of animal protein production
- Improved digestibility of proteins
- Improved protein functional properties, i.e. solubility, emulsification, foaming and viscosity
- Improved digestibility of proteins
Microbial enzymes can help valorize animal co-products

Food recovery hierarchy for animal co-products

Most preferred

Maximise Edible Yield
Maintain food-grade standards: by-products used in multiple product streams for domestic consumption and export markets

Process By-Products for Human Use
Maintain food-grade standards: used for hydrolysed protein, nutraceutical, pharmaceutical, and niche applications

Feed Animals
By-products processed into aquafeeds, livestock feeds, and pet foods

Industrial Uses
Digest into fuel and fertilisers

Composting
Nutrient rich soil amendment

Least preferred

Landfill/Incineration
Last resort

Lowest Value

Food Grade By-Products
Downgraded By-Products
Waste Products
How to add value to final products with microbial enzymes

**Raw material**
- Endo-proteases: Alcalase®, Savinase®, Novo-Pro® D, Neutrase®, Protamex®

**Hydrolysis process**
- Exo/endo-protease: Flavourzyme®
- Specific exo-protease: Protana® Prime
- Glutaminase Protana® UBoost

**Final product**
- Protein hydrolysate with premium umami flavor, high DH (degree of hydrolysis) and higher level of FAAs
- Protein hydrolysate with even better flavor (less bitterness), high DH (degree of hydrolysis) and higher level of FAAs
- Protein hydrolysate with better flavor (less bitterness) and some free amino acids (FAAs)
- Protein hydrolysate
Novozymes adds value at every step of your go-to-market journey

Understanding market demands

As the demand for protein hydrolysates grows, the requirements for meeting the market’s needs are becoming more diversified. Novozymes’ experts help you design the optimal hydrolysate to win in the marketplace.

Optimizing your product - with enzymes

Enzyme technology has unique and versatile functional benefits. Through experimentation, we select the optimal balance and dosage of enzymes to develop your solution and boost its performance. The Novozymes portfolio of enzymes is the industry’s most advanced and broadest, which enables us to choose exactly the solution you need.

Winning customers and sales

We help you meet your production and launch goals with a partnership mentality. You have access to a wealth of expertise, from labeling and regulatory to technical services, supply chain and commercial account management. Together we ensure that you achieve your business goals.