

FIBRATED PROTEIN PRODUCTS



NOVEL PROTEIN PRODUCTS

A NEW RANGE OF FINISHED PRODUCTS

MADE WITH FIBRATED PROTEINS.

HMEC technology allows transformation of plant or animal proteins into meat-like texture products presenting wide range of attributes in terms of fibrillation, surface appearance, color, texture, flavor, or product size.

These wet fibrated proteins are the base ingredient for "Novel protein products". Well balanced in nutrients, recipes include vegetable proteins from plants such as soya, cereals or legumes. Fish or meat based raw materials can also be used for human or animal consumption.

Novel protein products are either used as ingredients for vegetarian or vegan dishes, or prepared into ready-to-eat meals.



- **Environment-friendly and economically profitable:**

the Novel Protein Products carbon footprint is much lower compared to meat (12% less than chicken, 95% less than beef) or even to other meat substitutes.

- **Safe :**

the characteristics of the process ensure strict microbiological control of the product.

- **Healthy alternative to meat products :**

0% cholesterol, good source of protein and amino acids; good source of fibers, low fat content.



* Serving suggestion

CLEXTAL EXPERTISE

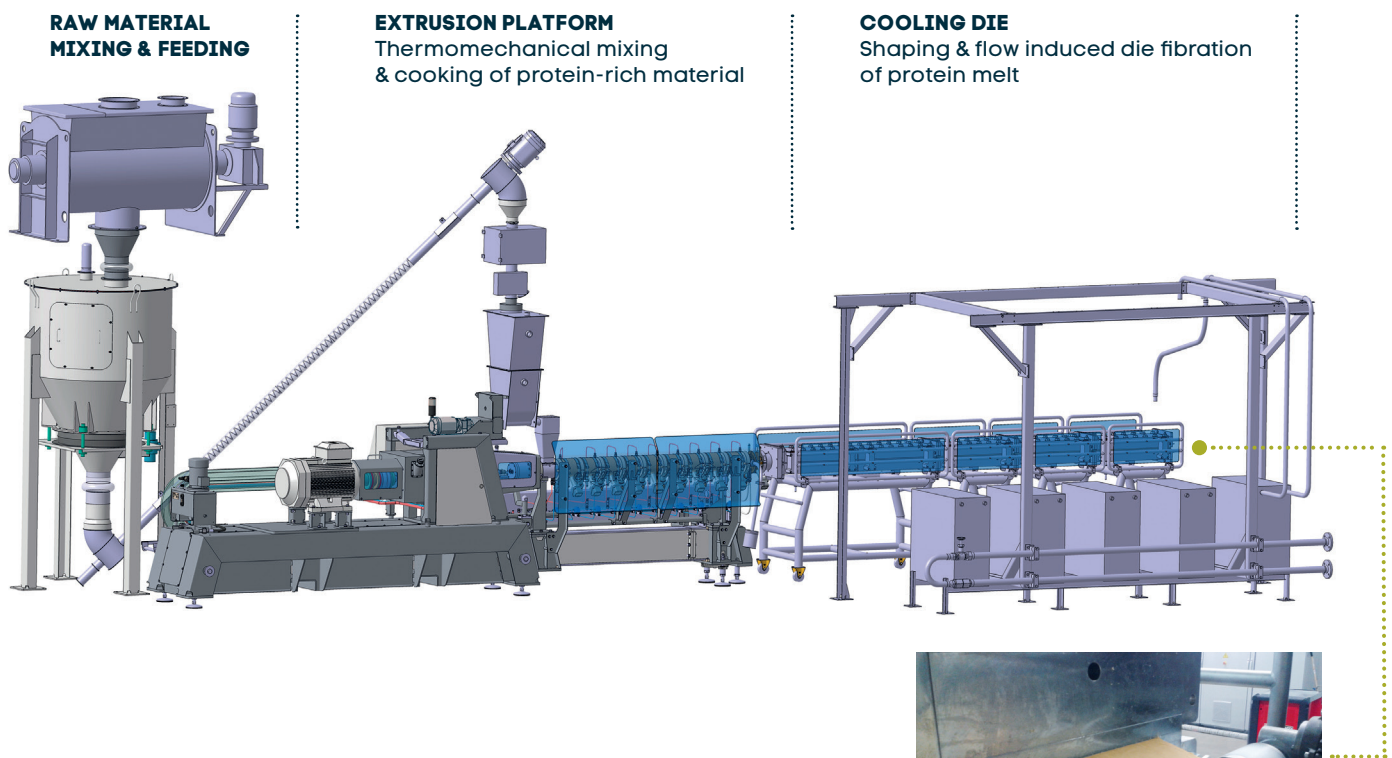
- With over 20 years experience in proteins fibrillation by twin screw extrusion technology, we pioneered the HMEC technology.
- Expertise in die technology for optimized texturization and shaping to make sophisticated fibrated products.
- Extrusion and product expertise to design a full range of Novel Protein Products and recipes through partnerships.

COMPLETE FIBRATED PROTEIN PRODUCTION LINE

PROCESS BASICS OF HMEC:

HMEC, High Moisture Extrusion Cooking technology allows to continuously cook food materials under high moisture conditions (50 to 80%) and to generate a fiber like texture thanks to controlled and optimized heat transfer.

The twin screw extruder mixes and cooks the protein-rich ingredients under tightly controlled parameters. The processed mixture is then pushed through a long temperature controlled die that enhance cross-linkage of proteins and formation of fiber like texture.



2 TYPES OF FIBRATION:



• Continued/longitudinal fibrillation

Novel protein products could be in the form of chicken fingers, chicken slices, brochette, boneless BBQ ribs, sausage, calamari, roast beef, and more...



• Discontinued fibrillation

Novel protein products could be in the form of tuna rilletes, pulled pork, pizza toppings, burgers, nuggets, meatloaf...



WORLDWIDE PRESENCE



Leveraging its core expertise in twin-screw technology, Clextral provides its customers with turnkey processing lines that integrate extruders, dryers and ancillary equipment. Its reliable and innovative systems are quality and excellence benchmarks in its three key markets: Food & Feed, Green Industries and Powder Industries. Clextral is also designing and manufacturing high-precision industrial pumps for the energy and chemical markets. Its global offering includes upstream design and testing of industrial solutions, equipment manufacturing, on-site installation and full maintenance and continuous process improvement services. Based in Firminy (France), Clextral is present on all five continents, providing local support to its customers all over the World.

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