



bredol®

# Emulsifier technology for effective feed production



Extrusion

**Nouryon**

# Value-added production of extruded feed with Bredol emulsifier

The use of Bredol emulsifier in the extrusion process gives a multitude of benefits.

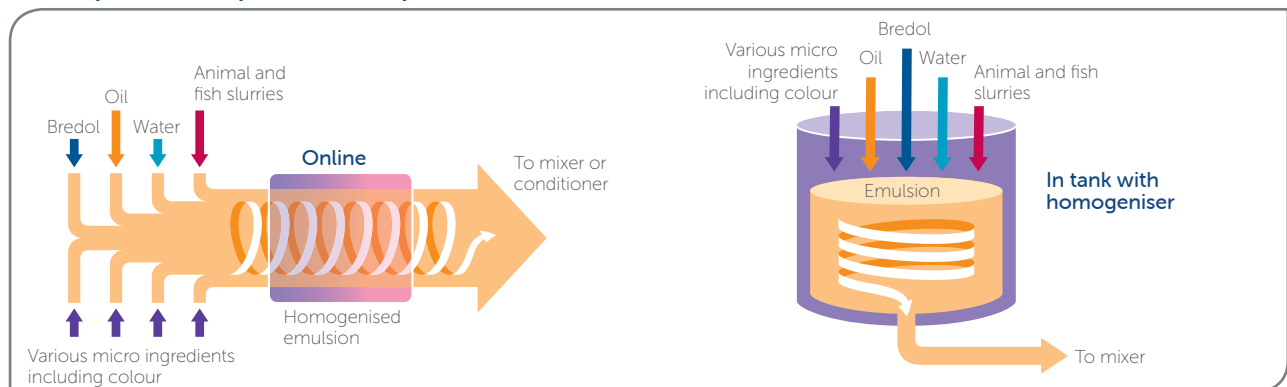
The water is better distributed and absorbed which improves heat transfer and conditioning in the meal. The amount of water needed for the extrusion process can be reduced which means lower drying costs and better finished product quality. The possibility of adding water and oil in emulsion form means improved distribution of both liquids.

An improved plastic effect is achieved which leads to smooth production without variability and better extruder capacity. In many cases it is possible to considerably increase the production speed. Apart from increasing

capacity there is added flexibility to produce feed of a desired density. This can influence the floating characteristics of aqua culture feed and permit more consistent package filling in pet foods.

The use of liquid components becomes easier with Bredol emulsifier. Fat and water and other ingredients form a fine mix which will be evenly distributed and absorbed in the meal leading to smoother production. High viscosity products become more manageable. Micro ingredients are better dispersed or dissolved and better utilised. In practice, the addition can be achieved through online mixing or via a tank with homogeniser.

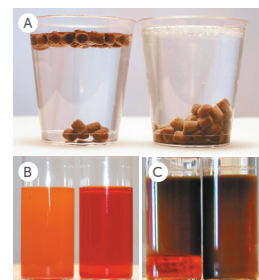
## Examples of liquid concepts



## After treatments

Bredol is used in various types of after treatment.

- A. Sinkability** Certain fish pellets which tend to float even after process adjustments can be coated by oil and Bredol improving the wetting ability and hence the sinkability
- B. Pigment solubility** The pigment solubility has been increased by help of Bredol
- C. Palatability – digest** Example of unstable digest which has been stabilised

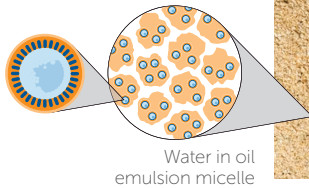


## With Bredol

Homogeneous mixture of water and oil



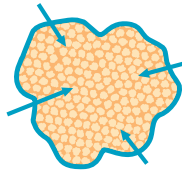
Homogeneous mixture of liquids evenly distributed and absorbed in the meal



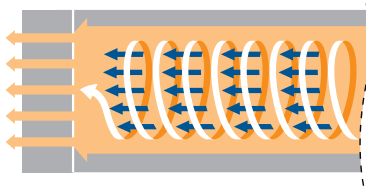
Water in oil emulsion micelle



Low water requirement for conditioning means less drying after extrusion

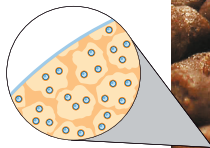


Fully conditioned meal



Even dry surface

Effective water and steam distribution giving uniform expansion and good structure

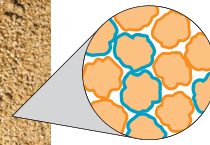


## Without Bredol

Water and oil separated

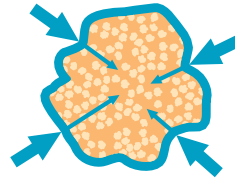


Lumps in the meal due to uneven distribution of liquids

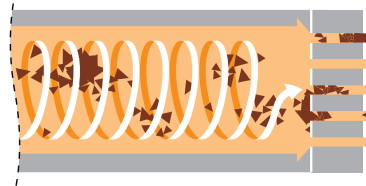


Water and oil added separately

High water requirement. High drying costs after extrusion



Partly conditioned meal



Uneven wet surface with breakout

Poor water and steam distribution causing uneven expansion



## Typical advantages in production

Improvements experienced using Bredol in Pet and Fish food extrusion trials at institutes and many other commercial sites.

- 10 to 30% output increase
- 15 to 30% water reduction leading to reduced drying costs
- 8 to 20% extruder power reduction
- Increased product quality and better control of density

Results will be dependant on product type, raw materials, and machine configuration.

Contact us directly for detailed product information and sample request  
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# Nouryon

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of more than 7,900 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

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The development of emulsifier technology is a continuous process within Nouryon and the company is the owner of patents in many countries. It is the policy of Nouryon to enforce these patent rights and, accordingly, Nouryon is actively monitoring the industry for infringement and is in the front line when it concerns feed and food health & safety as well as environmental care. The quality system is based on HACCP principles and is FAMI-QS certified.



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