

Emulsifier technology for effective feed production

—
Pelleting

bredol®

Nouryon



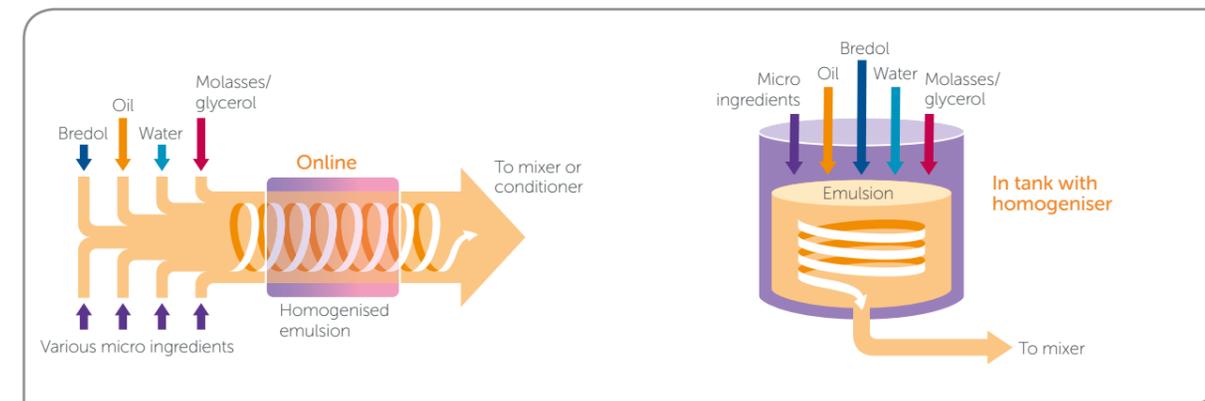
Cost effective pellet production with Bredol emulsifier

Bredol is the key to succeed in producing a homogeneous mixture of liquid components

The Bredol concept allows greater flexibility in choice of liquids and dry raw materials without problems in production. It leads to higher throughput with less resistance and energy consumption. Pellets of consistent quality with stable moisture levels are produced. A key to success is the ability to produce a homogeneous mixture of liquid components with the help of Bredol product's powerful emulsifying properties.

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 like molasses or glycerol become more manageable. Micro ingredients become better dispersed or dissolved and better utilised, pigments being one example. In practice, the addition can be achieved through online mixing or via a tank with homogeniser.

Examples of liquid concepts



Broiler trial (42 days) with added water

| | Control +2% added water | Bredol 683 +2% added water |
|---|-------------------------|----------------------------|
| Water content in feed after production, % | 12.5 | 13.5 |
| Body weight, g | 2321 a | 2312 a |
| Daily feed intake, g | 90.8 a | 90.5 a |
| Feed conversion rate (FCR) | 1.762 a | 1.760 a |

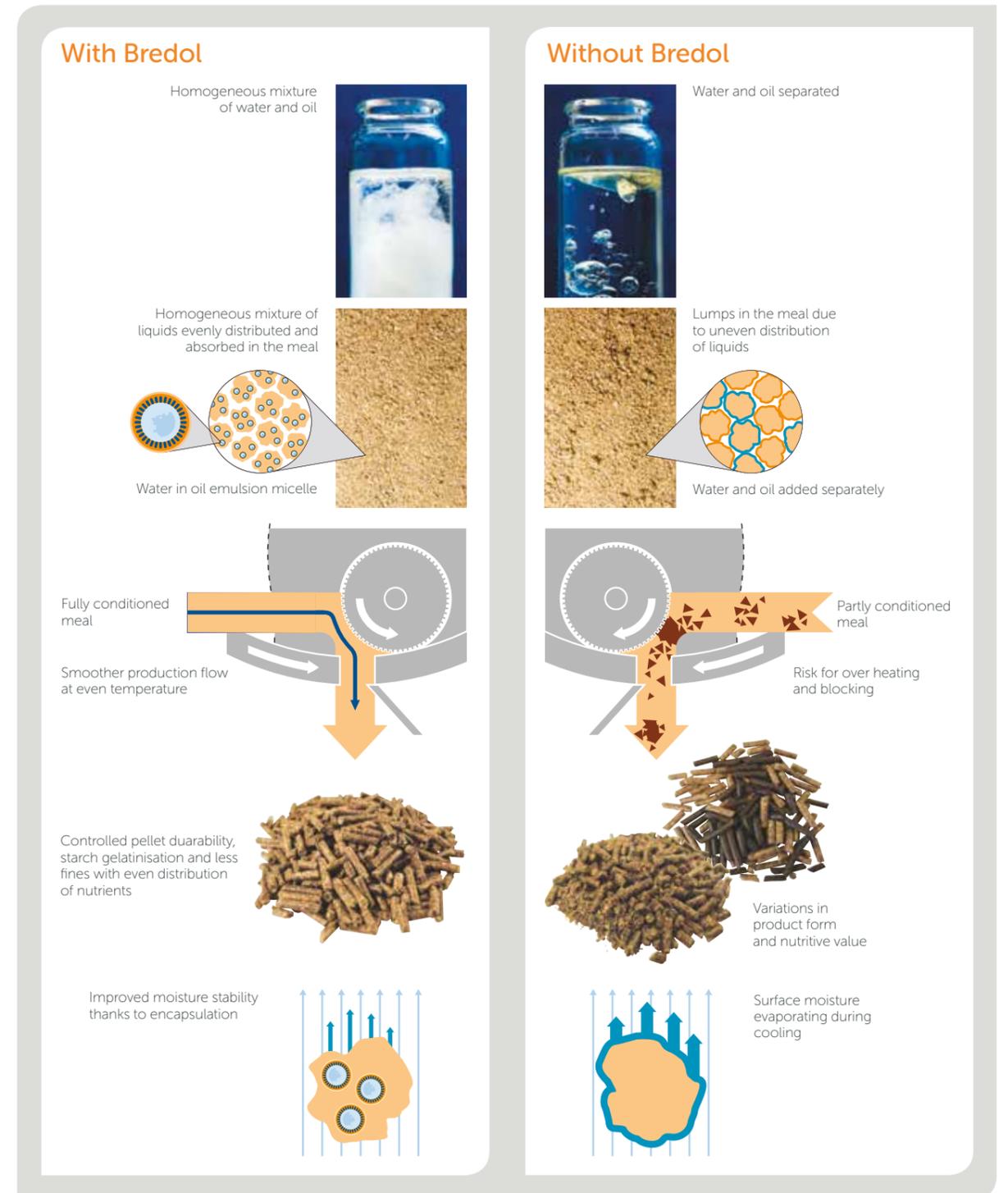
p < 0.05 Source: University of Leuven, Belgium, 2004.

The higher retained moisture content in the Bredol group did not affect the feeding and growth parameters.

Microbiological analysis of the broiler feed after two months storage

| | Control +2% added water | Bredol 683 +2% added water |
|---|-------------------------|----------------------------|
| Water content in feed after production, % | 12.5 | 13.5 |
| Aerobic bact., cfu/g | 4700 | 2000 |
| Moulds, cfu/g | 850 | <150 |

There was no microbiological growth despite higher moisture content in the Bredol group.



Typical advantages in production. Trial single pelleting

| Test run | Bredol ppm | Added water % | Oil in mix % | Press total Amps | Tonnes per Hour | Durability | Meal moisture | Nut moisture |
|----------|------------|---------------|--------------|------------------|-----------------|------------|---------------|--------------|
| Control | 0 | 1.0 | 0.5 | 375 | 18 | 96.2 | 13.5 | 11.4 |
| Bredol | 500 | 1.0 | 0.5 | 355 | 20 | 96.5 | 13.5 | 12.4 |

In the Bredol run, less energy was consumed and 11% higher output was achieved. This resulted in grinding process losses being replaced and the required moisture level was met.

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Nouryon is actively monitoring the
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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.

FAMI^{qs}

We are a global specialty chemicals leader. Markets worldwide rely
on our essential chemistry in the manufacture of everyday products
such as paper, plastics, building materials, feed, pharmaceuticals
and personal care items. Building on our nearly 400-year history, the
dedication of our 10,000 employees, and our shared commitment to
business growth, strong financial performance, safety, sustainability
and innovation, we have established a world-class business and built
strong partnerships with our customers.

We operate in over 80 countries around the world and our portfolio of
industry-leading brands includes Bredol.

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