for a better life
Seaweed extracts for improving FEED use in animals

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Who are we?

A marine biotechnology specialist
A dynamic group composed of 3 strategic fields

> Plant Care
> Animal Care
> Human Care

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OUR STORY

1995
Olmix Group creation
1st Expertise: TRACE-ELEMENTS

Headcount: 4

1997
2nd Expertise: CLAYS
Development of first natural solution to decrease the use of antibiotics

Headcount: 15
Turnover: 3 M€

2004
3rd Expertise: ALGAE
World patent on intercalated clay: AMADEITE®

Headcount: 25
Turnover: 7 M€

2012
ALGAE becomes the base of innovation
ULVANS programs + 5 new patents

Headcount: 250
Turnover: 56 M€

2015 > Headcount: 400 > Turnover: 74 M€

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OLMIX GROUP’S NETWORK

20 establishments
70 countries

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OUR VISION

The world must produce better and more with less to sustainably feed the planet

> Algae – a primary solution to meet this challenge

- Oceans provide all the nutrients needed for vital balance
- Algae - a source of nutrition and health
- Algae - a renewable resource

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The demand for animal protein is increasing globally. Poultry, Swine and Cows stand for 70% of the total demand. FAO estimates an increase from 40% to 120% by 2050.

The increase of Feed production follow the same trend. Wheat, maize, soya beans are the main components of animal feed and the increase in production will consequently consume more arable land, fresh water and chemicals.

Producing animal proteins with less feed is becoming a major goal

Economically
Sustainability
Meat, eggs and milk producers’ margin is considerably dependant upon feed efficiency.

⇒ Food Conversion Ratio (kg of feed to produce 1kg of livestock)
⇒ Improving the FCR increases the net gain

The more expensive the feed, the more important to invest in feed efficiency!

<table>
<thead>
<tr>
<th>FEED COST DECREASE WITH FCR IMPROVEMENT</th>
<th>Low price</th>
<th>High price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard broiler feed price ($/T)</td>
<td>350</td>
<td>450</td>
</tr>
<tr>
<td>Standard feed cost with FCR = 1,8 ($/T of produced liveweight)</td>
<td>630</td>
<td>810</td>
</tr>
<tr>
<td>Improvement of 2% in FCR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed cost ($/T of produced liveweight)</td>
<td>617,40</td>
<td>793,80</td>
</tr>
<tr>
<td><strong>Net gain ($/T of produced liveweight)</strong></td>
<td><strong>12,60</strong></td>
<td><strong>16,20</strong></td>
</tr>
<tr>
<td>Improvement of 4% in FCR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed cost ($/T of produced liveweight)</td>
<td>604,80</td>
<td>777,60</td>
</tr>
<tr>
<td><strong>Net gain ($/T of produced liveweight)</strong></td>
<td><strong>25,20</strong></td>
<td><strong>32,40</strong></td>
</tr>
</tbody>
</table>
A reduction of enzyme activity in the small intestine leads to an incomplete digestion of the feed, and thus a reduced feed efficiency (or low Food Conversion Ratio, FCR).

It also causes an imbalance of the intestinal microflora and favors the development of pathogenic bacteria causing digestive troubles to the animal (increase in pharmaceutical treatments).
A novel product based on combining a micronized Montmorillonite substrate exfoliated with specific seaweed extracts (from *Ulva* sp. and *Solieria chordalis*), was used in trials for improving the FCR in animals by:

- Favoring contact between substrate and enzymes. Up to 800m$^2$/g surface for enzyme contact and support of hydrolysis.
- Improving enzyme activity with cofactors (metallic ions) brought naturally with the seaweed. Clay displays accessible forms of the ions.
ANIMAL TRIALS: IMPROVING ILEAL DIGESTABILITY

Objective: evaluating the capacity of clay associated with seaweed extracts to increase the ileal digestibility of nutrients

Scientific partnership with INRA Saint-Gilles

Material & methods
- Ileorectal anastomosis of 5 pigs (≈ 30kg)
- Trial diets:
  - Control: standard diet
  - MFeed+: standard diet + 0.1% MFeed+
  - LP-LE: low protein and low energy diet (to estimate endogenous losses)
- Calculations
  - Digestive utilization coefficient (CUD) in ileum (CUDi) for DM, OM, N, CF, NDF/ADF, GE and aa
  - CUDs (standardized), taking into account endogenous losses
Apparent ileal digestive utilization coefficient (CUDi)

- Energy: 70.7% (73.1% increase, *p<0.05)
- Dry matter: 68.4% (70.7% increase, ***p<0.001)
- Organic matter: 71.2% (73.4% increase, ***p<0.001)

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Standardized digestibility of amino acids (CUDs, %)

**P ≤ 0.01; *P ≤ 0.05

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The introduction of clay associated seaweed extracts to standard pig diets, increased by 3% the digestibility of the:
- Energy
- Organic matter
- Proteins

Results indicate that amino acid contents (essential and non-essential), produced by enzymatic hydrolysis of proteins, increase by 3 to 4%.

The improvement of digestive efficiency by 3-4% is liable to reduce the feed cost and increase the net gain for the farmer.

Global strategy => make more with less...
Thank you for your attention

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