



Industrial Potential and Valorisation of Biotech Solutions for the Animal Feed Business



### Nuscience as stakeholder in animal production chain

## **Knowledge partner** in nutrition and health





#### 1. Feed materials & additives

- 2. Premix & Concentrate producers

 Additive producers (vitamins, minerals, enzymes,...)

Plant growers

(cereals,

proteins

vegetable

 Functional Feed **Ingredients** 

- Majority of feed materials directly delivered to feed producers
- Tendency to more concentrated premixes and direct delivery of additives to feed producers

#### 3. Feed producers

- Poultry
- Pigs
- Cattle
- Aquaculture
- (petfood)

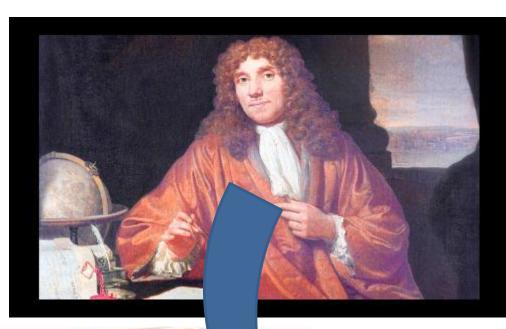
# protein

- Poultry meat & eggs
- Pig meat
- Beef
- Milk
- Fish

- 5. Animal protein processing
  - Slaughterhouses
  - Egg processing
  - Milk Processing



### **Introduction: What is Fermentation?**



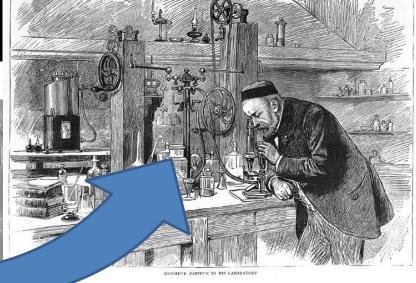
#### Bacteria

- Gram positive

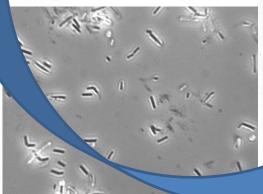
→ Lactic Acid Bacteria

- Gram negative

Yeast Fungi

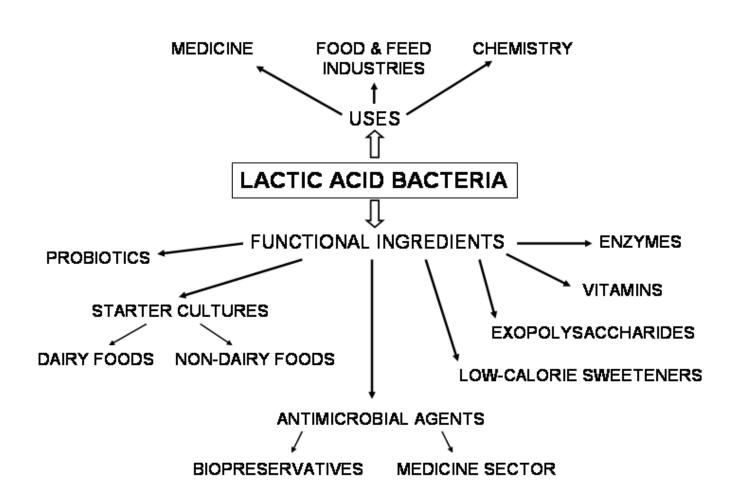








### **Many Potentials for LAB**





# **Applications of Fermentation**





Alcoholic beverages (YEAST!)

Bioethanol (YEAST!) → DDGS

- Fermented foods: bread, soy, ...
- Biomass
  - SCP → nutritional content
  - Probiotics → GIT health
- Metabolites: lactic acid
- Feed Fermentation





# Why Animal Feed Fermentation?

- Release more nutrients & energy from raw materials
- Reduce use of phytase
- To acidify the feed: lactic acid
- To improve feed intake
- Reduce use of medication

•



# Today's "Reference" Technology











# Today's "Reference" Technology









# **History based PITFALLS (i)**

### Fermentation of complete feed

- Hygiene !!!
  - Pre-, in- and post fermentation
  - @ Farm!
- Strong discipline required
- Expiry date of fermented feed: MAX. 3 weeks
  - Logistics to and conservation at farms
- No antibiotic use: living micro-organism
- Major responsibility at feed manufacturer
- Easy-to-copy: competitive edge?





# **History based PITFALLS (ii)**

### Fermentation of grains to complement feed

- Only applicable at farms applying liquid feeding!
  - Less applicable in all farms (no "pass-partout")
- Fermented grain supplemented to liquid feed ("premix" concept)
  - Need for regular mixing to avoid segmentation
  - Different grain blends (35-45 % DM) depending on application
- Less hygienic & discipline problems
  - Due to smaller blend volumes of ferment production
- Expiry date: MAX 2. weeks
- No antibiotic use: living micro-organism
- Major responsibility at farmer
- Easy-to-copy: competitive edge?





# Going beyond the State-of-the-Art

- Copy-proof and identified in-house strain!
- Applicable in solid feed & full flexibility: "pass-partout"
  - Blend ferment in low amount with your feed application
    - Production foreseen in China and Belgium
  - Fully under control
- Only need for the basic feed hygienic & discipline rules @ farm
- Normal expiry dates of the feed (6 months)
- Not sensitive to antibiotics
- Major responsibility at Nuscience





### Ways to deliver FF Concepts to the Farmer

### Models with minimal proven earn-back

- Sell the whole fermented feed @ farm
- Sell inoculum for fermenting raw materials / feed @ farm
- Sell "fermented premix" to farmer for blending in (liquid) feed
   @ farms

All above wet/semi-dry/dry

### Proposed earn-back model

Sell ferment-upgraded-feed @ farm → Nuscience strategy





# **THANK YOU**