Animals for Tomorrow

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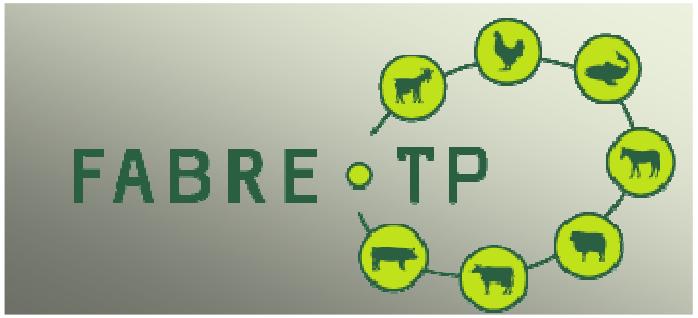

The Context

- A 50% increase in human population within 40 years
- a strong increase in animal products demand, but also a competition with other demands…
- A need to produce more at the world level, while increase animal production sustainability
- 3 pillars of sustainability : economic, social, environmental

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Economics

- At the European level, need to strengthen to face with very strong competition from producers worldwide
- Need for quantity, quality, food safety, in relationship with market demand
- Sustainability of the labour and farmer's income

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Society

- To produce in the respect of animal welfare and ethics rules
- Use robust animals
- Acceptability of technologies

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Environment

- To limit environmental footprint of animal production (use of energy, land, pollution…)
- To reduce animal contribution to global change
- To adapt animal production to global change

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A Vision

- Need for an overall shared approach
- Across disciplines (classical sciences, biotechnologies, integration)

=> Animal Task Force gathering different platforms

- Across actors : industry, science, public bodies
- For a common thinking and joint funding

=> A forum : '*Animal Farming for Tomorrow*'

- to establish priorities

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Where should we go ?

- Vision paper (very large and rich)
- Survey conducted by FabreTP targeted to industry and academics
- Many important topics, priorities still to establish over time (strategic, common interest)

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Where should we go ?

Breeding objectives should be more and more complex and incorporate :

- **Robustness (disease resistance, longevity, flexibility to more diverse production systems)**
- **Adaptation to market (quality of products)**
- **Efficiency (input consumption, longevity and reproduction, environmental footprint)**
- **Adaptation to global change (feeds and nutrition, increase of pathogens, heat tolerance…)**

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New opportunities (1)

Genomic selection could be more efficient than classical selection

- low heritability traits
- phenotypes concentrated in a reference population
- potentially strong selection pressures

=> Should allow to select more easily on complex traits

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New opportunities (2)

New phenotypes possibly available

- **new measurement systems (IR, imaging…)**
- **precision farming (electronic devices), for reproduction, diseases, behaviour, feed consumption…**

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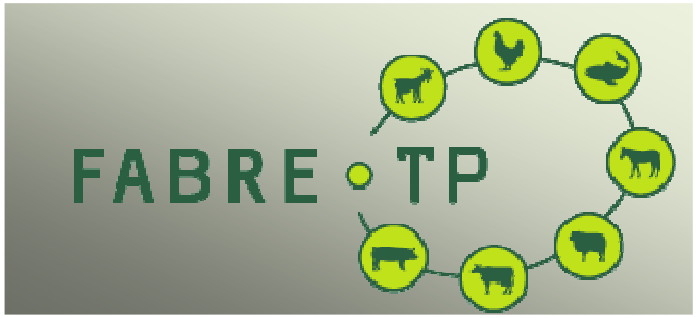
New opportunities (3)

New genomic tools

- genotyping
- sequencing
- gene expression
- interactions
- system biology



A first set of priorities (1)

Systems biology and gut

- **ecological footprint**
- **genetics and nutrition**
- **metagenomics of gut flora**
- **mucosal immunity**
- **gut diseases**

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A first set of priorities (2)

Genomic selection and next generation evaluation systems

- **Overall efficiency and competitiveness**
- **Other than dairy cattle**
- **Multi-population evaluation**
- **New objectives**
- **New implementations of breeding programmes**
- **Selection for each environment ?**
- **Links with biodiversity**

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A first set of priorities (3)

Next generation animal sequencing to meet tomorrow's needs

- **A revolution to Science, with still unknown applications**
- **we cannot afford to neglect these opportunities**
- **to prepare the relevant infrastructure and their relationships with animal production sector**

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A first set of priorities (3)

Next generation animal sequencing to meet tomorrow's needs

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A first set of priorities (4)

Housing – welfare - social interactions

- mostly (but non only) pig and poultry
- prepare the major on-going changes

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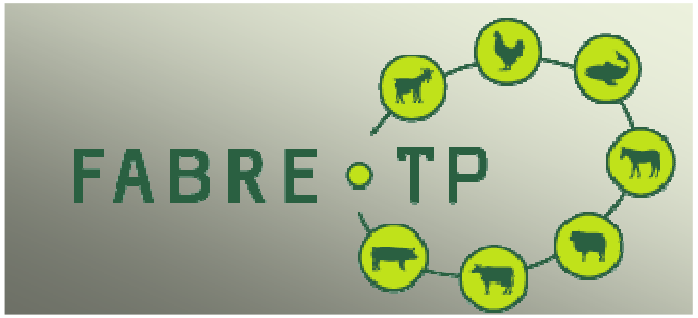
A first set of priorities (5)

Feed substitution by vegetal ingredients in Aquaculture

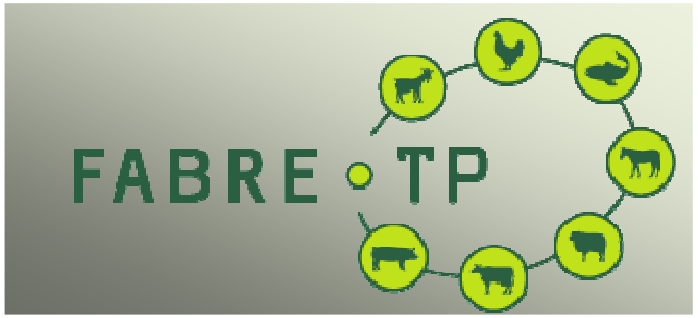


Other high-rank discussed priorities

Reproduction

Disease resistance (other than gut related)

Diversification of breeding objectives – new phenotypes



Thank You !