

Opportunities for Synergy between plant and animal breeding – True Hybrid Vigor

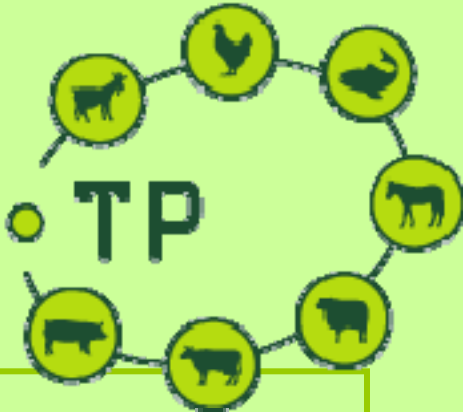
Ken Laughlin

Group VP Policy and Strategy- Aviagen

The European Forum of Farm Animal Breeders
(EFFAB)—Steering Committee
Farm Animal Breeding and Reproduction in Europe
FABRE – *Steering Group*

- FABRE TP
- Global Warming issues
 - Highlight FCR
- Food ↔ Feed ↔ Fuel ?
- Mycotoxins
- Bees

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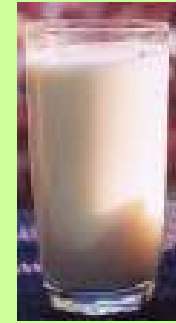
Introduction of FABRE TP

Sustainable Farm Animal Breeding
and Reproduction
Technology Platform





The livestock sector in Europe



- Production in Europe (EU25):
 - 43 million tonnes meat + 147million tonnes milk (2005)
 - Annual output of livestock sector €132 billion – 40% of agriculture output (2004)
- Production in Europe (EU15):
 - 5.4 million tonnes of fish (2001)
 - 13.5 million people in farming on 6.5 million holdings (2000)
- Diverse agricultural systems:
 - Organic/conventional and intensive/extensive
 - Niche production and marginal lands
 - Cattle, sheep, goats, pigs, poultry, fish, etc



Breeding & dynamics of livestock

Gain for Europe from improvements due to animal breeding \approx €2 billion annually & cumulative

Livestock production is changing rapidly:

- Worldwide competition food \Leftrightarrow feed \Leftrightarrow fuel
- Prices paid for products: static or falling
- Increased pressure on land
- Changes in public perception of animal farming
- Increased competition through globalisation
- Changes in the Common Agricultural Policy
- Increased demand in industrialising economies; Brazil, China, India

FABRE TP

- Improve European competitiveness
 - European breeding world-class
 - Significant economic sector in a rapidly changing market
 - Increased global competition
- Industry driven
 - EFFAB; ICAR; COPA-Cogeca...
 - But, broad stakeholder base: research groupings; animal welfare groups etc
- Exploitation of a step-change in science
 - Genomics “revolution”

32 Technology Platforms

TP's should:

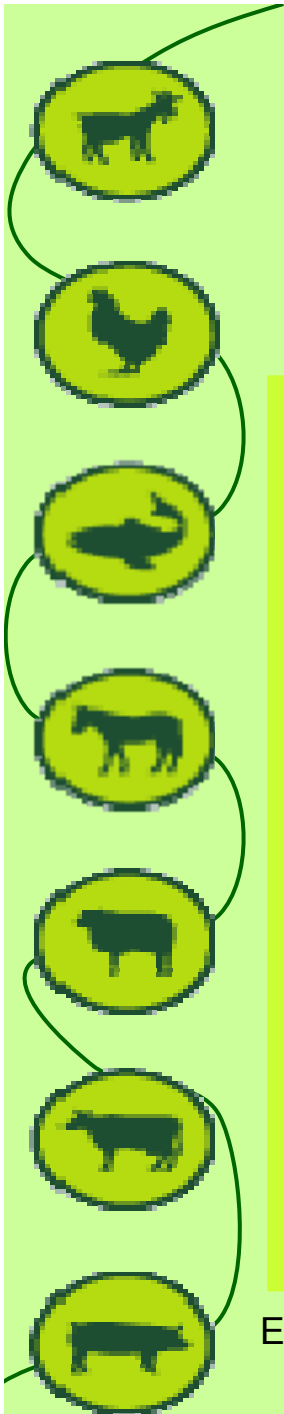
- Define a **vision: Vision paper**
 - Medium to long term
- Define a **strategic research agenda (SRA)**
 - The research that needs to be carried out to achieve the vision
 - The sector(s) which need to carry out different research activities
 - The sources of funding available (private, national, European)
- **Implement** the strategic research agenda
 - Guidance of FP7 *and other research programmes*
- Not become a “closed shop”:

Within Agriculture next to FABRE are :

- Global Animal Health
- Plant breeding
- Food for Life
- Forestry
- Non-food
- Aquaculture

Developing the Technology Platform

1. Emergence and set up = strategic **vision** document, initiated by industry
2. Definition of **Strategic Research Agenda**: reseach and technological developments for medium to long term (wide range of stakeholders)
3. **Implementation** of Strategic Research Agenda (SRA) along EU research

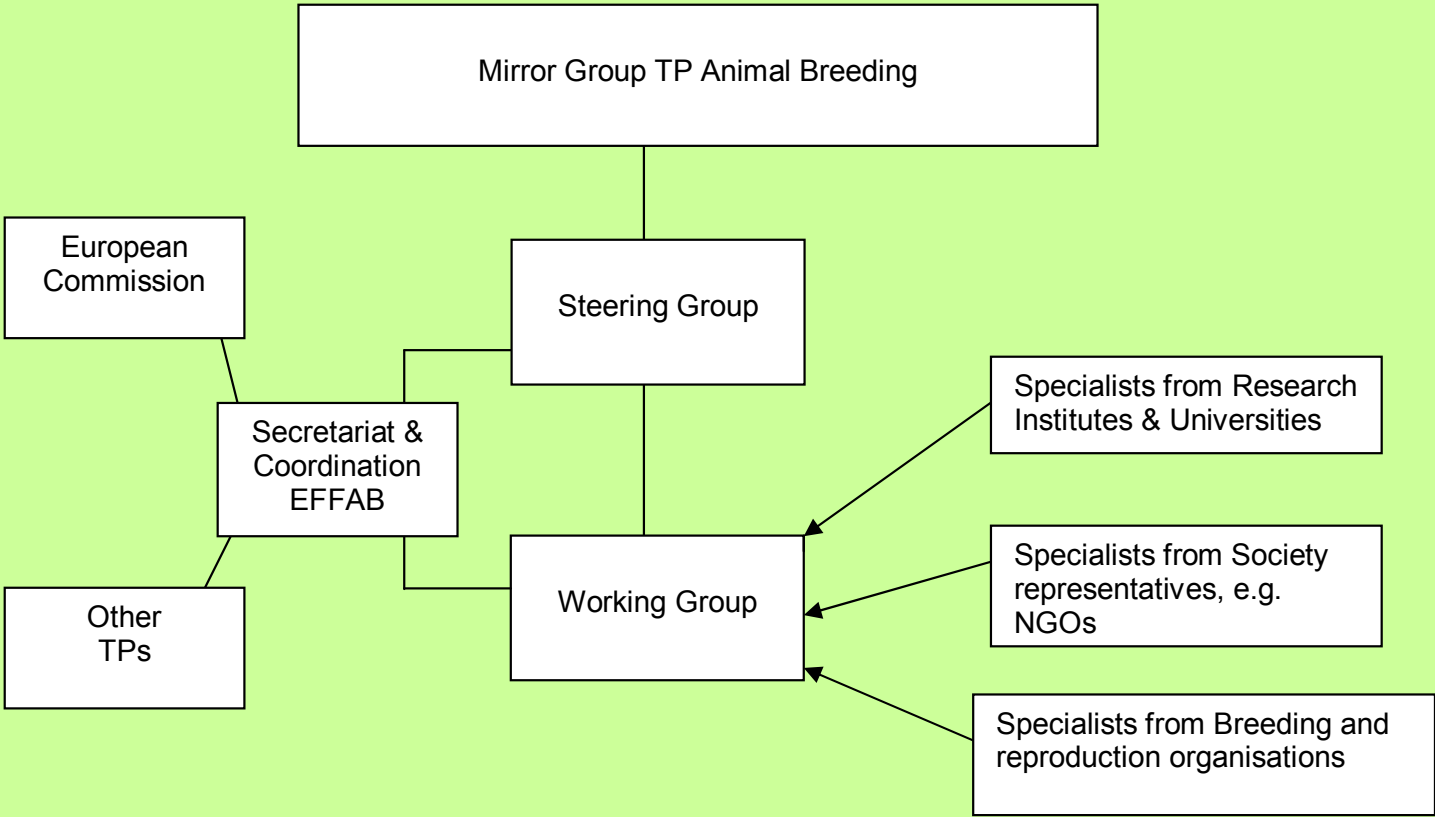




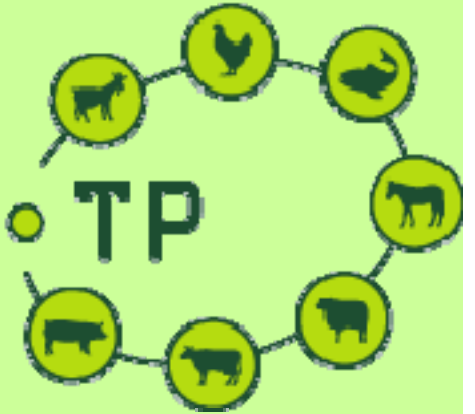
Status of FABRE TP

- 20 April 2005: discuss set-up of TP (initiated by EC)
- May/June 2005: start up working and steering group
- July 2005: www.FABRETP.org
- Oct + Nov: wide discussion of draft paper
- 2nd March 2006: Launch of Vision paper with broad industrial, scientific and NGO commitment
- 1 July 2006: Start SRA project
- December 2006: SRA0
- Summer 2007: draft SRA
- September 2007: Society discussion Rome
- 24 October 2007: Mirror group discussion Paris
- End 2007: final SRA including country paragraphs
- 2007: set up of implementation plan

Management structure FABRE TP



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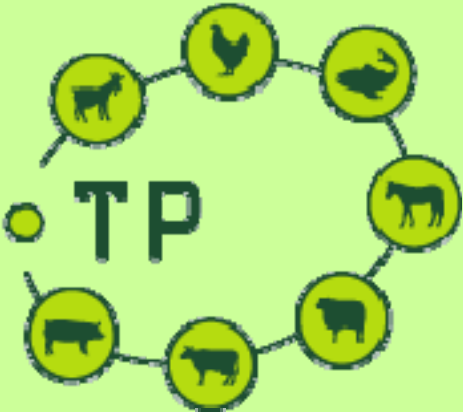
Strategic Research Agenda





SRA

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Industry led

- Consensus among stakeholders to **meet vision**
- **Facilitate and accelerate R&D** in animal breeding and reproduction to meet the opportunities and needs of stakeholders
- Work group continues with **Expert groups** to prepare SRA
- Involvement **Member States**
- Also socio-economic and horizontal issues
- Steering group will proactive **investigate funding possibilities**



Expert Groups



1. Species

1. Cattle
2. Sheep/goats
3. Pigs
4. Poultry
5. Horses
6. Aquaculture
7. Other/companion

2. Themes

1. Food Quality and Safety
2. Health, Welfare and Performance
3. Diversity and Distinctiveness

3. Technologies

1. Genomics
2. Genetics
3. Reproduction

Horizontal issues



Technology transfer, education
committee advice in SRA 1

Legal aspects: legislation, IPR
committee workshop
Autumn 2007 Brussels

Horizontal meeting ethics, global aspects,
consumers...
'society' organisations
video web cam
November 2007 Rome



Country discussions



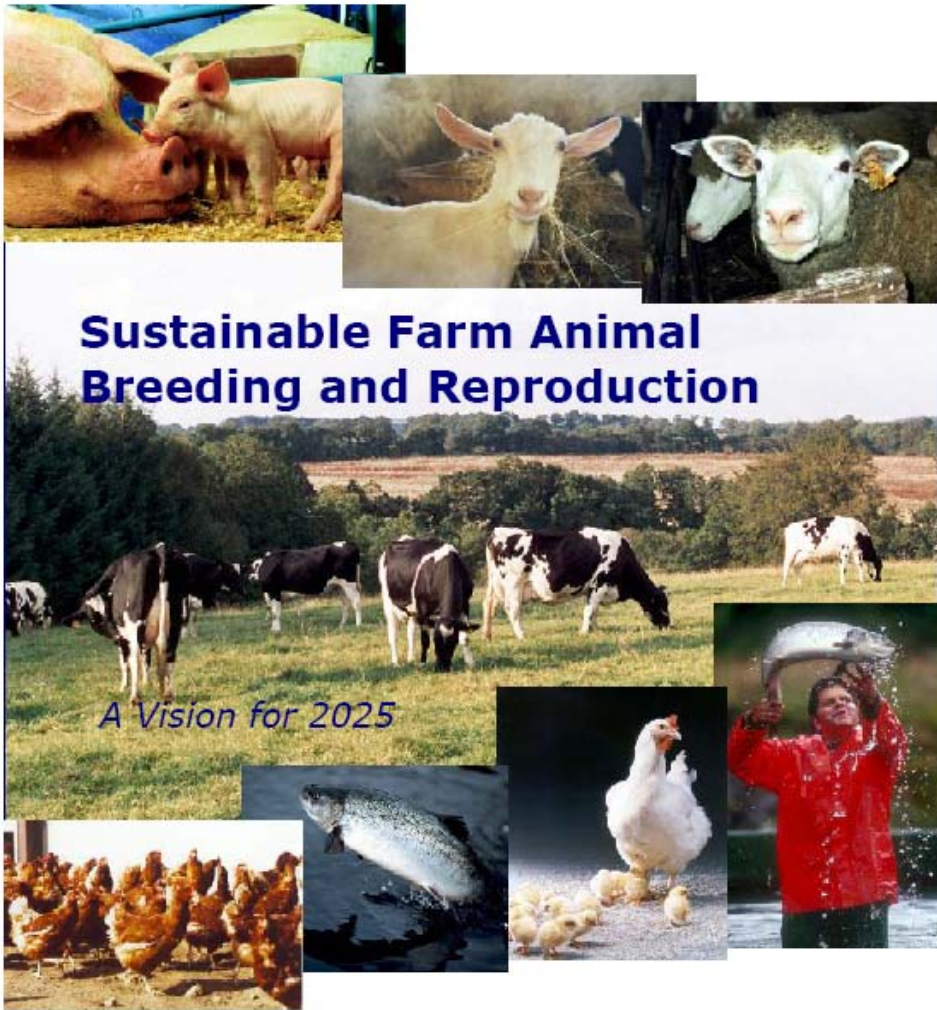
SRA Discussions

in all 27 EU member states + CH + NO
to create national awareness and additional
national funding

- research, industry, ministries, other funding bodies...
- general opinion
- specific country emphasis + issues
- national Breeding Platform
- Number of participants is large (from 16 to 57)



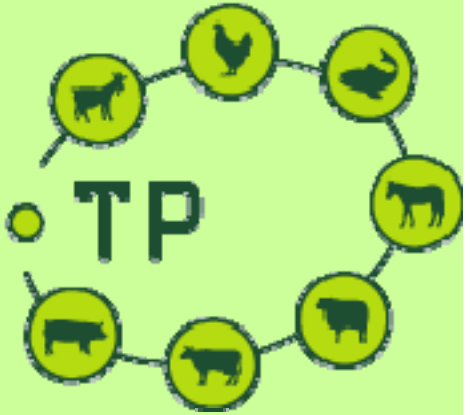
Working Group "FABRE Technology Platform"
February 2006



Sustainable Farm Animal Breeding and Reproduction

A Vision for 2025

FABRE TP



INVITATION

Final presentation &
discussion SRA

24 October 2007 Paris

www.fabretp.org

Global Warming issues

- Life Cycle Analysis(LCA)
 - Silsoe –Cranfield
- Allows comparison of Animal agricultural systems
- Opportunity to Evaluate Breeding Goals and production issues.

Table II The main burdens and resources used in animal production (current organic share shown in parenthesis).

Impacts & resources used per t of carcass, per 20,000 eggs (about 1 t) or per 10m³ milk (about 1 t dm)	Beef (0.8%)	Pig meat (0.6%)	Poult meat (0.5%)	Sheep meat (1%)	Eggs (1%)	Milk (1%)
Primary energy used, GJ	28	17	12	23	14	25
GWP ₁₀₀ , t CO ₂	16	6.4	4.6	17	5.5	10.6
Eutrophication potential, kg PO ₄ ³⁻	158	100	49	200	77	64
Acidification potential, kg SO ₂	471	394	173	380	306	163
Pesticides used, dose ha	7.1	8.8	7.7	3.0	7.7	3.5
Land use (1)						
Grade 2, ha	0.04			0.05		0.22
Grade 3a, ha	0.79	0.74	0.64	0.49	0.67	0.98
Grade 3b, ha	0.83			0.48		
Grade 4, ha	0.67			0.38	18	

Global Warming issues

- For pigs and poultry 60-70% of energy use is feed - production, transport and milling
 - Opportunities on raw materials
 - Type
 - Location
- Opportunities on waste management
- LCA could be used to determine combined Breeding Strategy

Food ↔ Feed ↔ Fuel ?

- Grains for Ethanol
- Oilseeds for biodiesel
- Will we see plants selected for Feed or fuel ?
- The bi-products are consumed by animals
 - Would “fuel plants” have acceptable bi-products ?

Mycotoxins

- Not a new issue but more focus
 - Maybe more incidence?
- Costly in direct and indirect effects on animals
- Concern about Carry-over of Toxic Substances from Feed to Food
- Problems could be addressed at primary production stage ?

Bees

- “Keystone” species but 25% of UK Native bees endangered
- Commercial Bees now have a prime function as pollinators.[In EU worth €13.9bill]
- May enhance yield of wind pollinated crops
- Commercial Bees have Colony Collapse Disorder CCD and many parasitic diseases
- The dramatic losses are associated with Intensification of bee usage.

Summary

- FABRE TP provides an opportunity for communication and collaboration between Plant and Animal Breeders.
- Specific Issues may benefit from a joint approach
 - Global Warming
 - Fuel from crops
 - Mycotoxins
 - Bees

Conclusion

- At a time of ever greater dissection of Biological subjects towards genomics and molecular approaches there is still a great opportunity to search out the synergies between the target outputs of whole animals and plants.
- A combined approach to some of the modern challenges could result in true Hybrid Vigor.