

# Animal Trait Ontology

EFFAB  
 25<sup>th</sup> October 2007

## What is Trait Ontology?

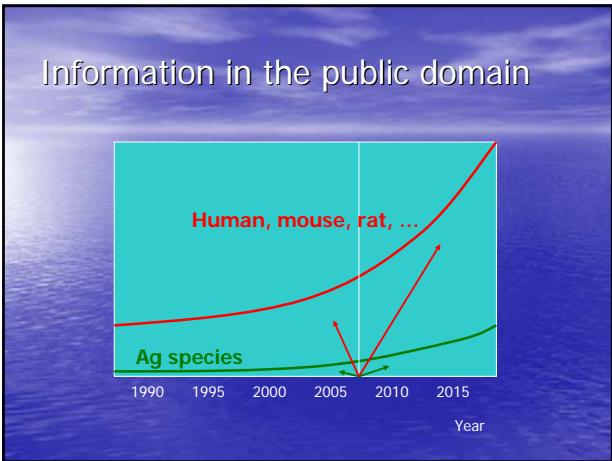
- Production traits are sets of animal phenotypes described for their nature, quality, quantity and biological stage. Due to differences in methods of detection or measurement, scope of description and/or customs, **a trait may be described in several different ways**. In order to compare and use information, we have to make a "standard" way of trait description. To solve this problem, "**Trait Ontology**" is introduced to classify and organize the traits.
- An ontology is a classification methodology that defines a **common vocabulary** in a **structured way** for useful information sharing.

## Global ATO project



Other

James Reecy	Hein van der Steen	???
NRSP-8 Animal	ATO project	???
Trait Ontology	coordinator	???
Project	EC projects	???
	(EADGENE, SABRE)	???



## Collaborative Ontology Building (COB)



Swine





Horse



Cattle



Chicken

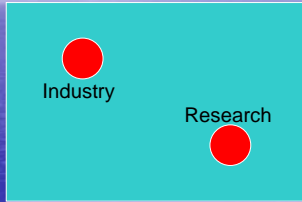
By Mike Williams-Ingold

## Traits

- \$ profit/sow place/year, .....
- PWSY
- Litter size, piglet survival, farrowing interval, ...
- Ovulation rate, robustness, disease resistance
- Level of hormones, enzymes, .....
- Pathways, gene expression, gene function, ...
- Polymorphisms

## Gap between RO's and Industry

Profit  
 Market share  
 ROI  
 The share value



Science  
 Publication  
 Research funding  
 Prestige

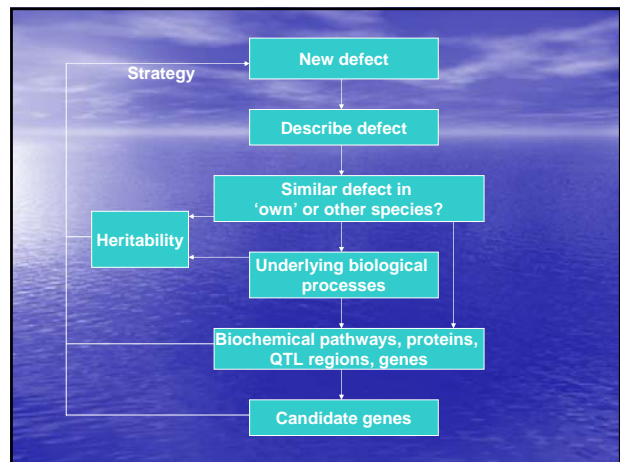
## Communication

- Across trait levels
- Across species
- Across regions
- Across research groups
- All speak the same language?
- Make comparative genomics work
- Animal Trait Ontology



## Purpose

- The goal is to create a collaborative animal trait ontology that will be used as a standard for researchers (industry and institutes) of animal traits



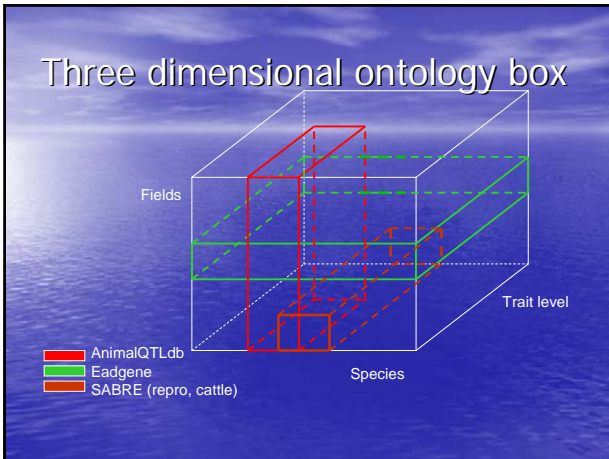
## Why use an Ontology?

- To enable use of knowledge across species
- To analyze knowledge
- To facilitate comparative genomics
- To do that efficiently



## AIMS

- Development of the Animal Trait Ontology (ATO) by including trait information for farm animals (pig, chicken, cattle and others) and aquaculture species
- Create a database that will allow the linkage of the trait and other information (QTLs, SNPs, associations, ...) within and across species incl. mouse, rat, human, etc.



### Risks

Overlap  
 Waste of resources  
 Resulting in a mess  
 No use, No added value

- ### Eadgene Ontology Project
- Industry driven (and also useful for research)
  - Field: Host-pathogen interactions and immunology
  - Dictionary, thesaurus, definitions, ..... for farm animal production traits
  - Link information across species (comparative genomics) and within and between trait levels (biology of host species)

- ### Future Development
- **ATO: Pig, Cattle, Chicken, Horse, Sheep, Salmon, Shrimp, ...**
  - **Involve animal industry and research groups**
  - **Integrate with Human, Rat and Mouse databases**
  - **Refine the COB editor**
  - **Develop ontology query tools**
  - **Link information across databases**

- ### Next steps
- Create/join collaborative group (Eadgene, ISU, .....)
  - Define the expected added value that the ATO brings
  - Evaluate what exists in terms of Animal Trait 'Ontologies' and on-going/planned projects
  - Find 3-5 industry specialists per species to define the relevant economic traits and component traits
  - Focus for EADGENE project on Host-pathogen interactions and immunology.

