Animal Trait Ontology – what do we need it for?

Pieter Knap

Details

Ina Hulsegge

Overview & Developments

Hein van der Steen
Animal Trait Ontology – what do we need it for?

Animal breeding organizations: commercial goals

• Survive
• Make a profit
• Grow

Ways to achieve these goals

• Cultural & political
• Financial & marketing
• Technical
Animal breeding organizations: commercial goals

• Survive
• Make a profit
• Grow

Technical ways to achieve these goals

When we make enough $\Delta G$, we will...

• Survive
• Make a profit
• Grow
When we make enough $\Delta G$, we will...

- Survive
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Animal Trait Ontology – what do we need it for?

How does ATO help us reach more $\Delta G$?
How does ATO help us reach more $\Delta G$?

What is ATO? What is “ontology”?

Ontology:
Tools to find, describe, categorize & manage information, and to make it accessible.

ATO: information on Animal Traits

Phenomics, genomics, all the other –omics

Recording, genetic structure, physiological pathways, interrelationships, databases
ATO is important on this side of the picture, to understand what is going wrong.

**Statistics-driven breeding technology**

- Selection on own records
- BLUP
- Genomic selection

**Biology-driven breeding technology**

- Selection on own phenotype
- Selection on own & family records
- MAS
- Quantomic selection

ATO is important on this side of the picture, to support the primary action.
Biology-driven breeding technology

- Selection on own & family records
- MAS
- Quantomic selection

Complexity increases

Importance of ATO

- low
- high

Animal breeding organizations: commercial goals

- Survive
- Make a profit
- Grow

Technical ways to achieve these goals

Different structures

Poultry | Fish | Pigs | Dairy cattle | Beef cattle | Sheep | Goats | Bees

Small dispersed | organization size germplasm | large concentrated
Different ways to implement the same technology

- Selection on own records
- Selection on own & family records
- BLUP
- MAS
- Genomic selection
- Quantomic selection

Different ways to exploit ATO

- Poultry
- Fish
- Pigs
- Dairy cattle
- Beef cattle
- Sheep
- Goats
- Bees

Different structures:
- Small organizations: dispersed germplasm
- Large organizations: concentrated germplasm
ATO: technology under development

- No mature methodology
- Various approaches need to come together
- Lead time
- Risky investment
  - Betamax, VHS
  - CP/M, DOS, OS/2, Windows
- Difficult to create competitive advantage
- Easy to create competitive disadvantage
- Pre-competitive development
- EADgene
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