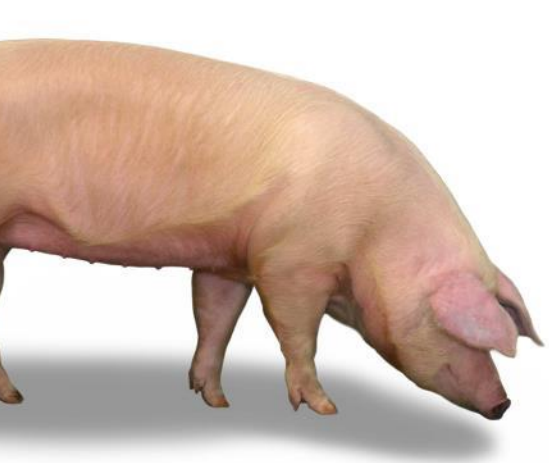
Topigs Norsvin: From research to succesfull customer value

Hans Olijslagers, CTO



Topigs Norsvin
PROGRESS IN PIGS

Facts & figures

1,6 million crossbred gilts/year

100 million slaughter pigs produced/year

9 million doses of semen/year

Topigs Norsvin
PROGRESS IN PIGS

Facts & figures

present in **54** countries

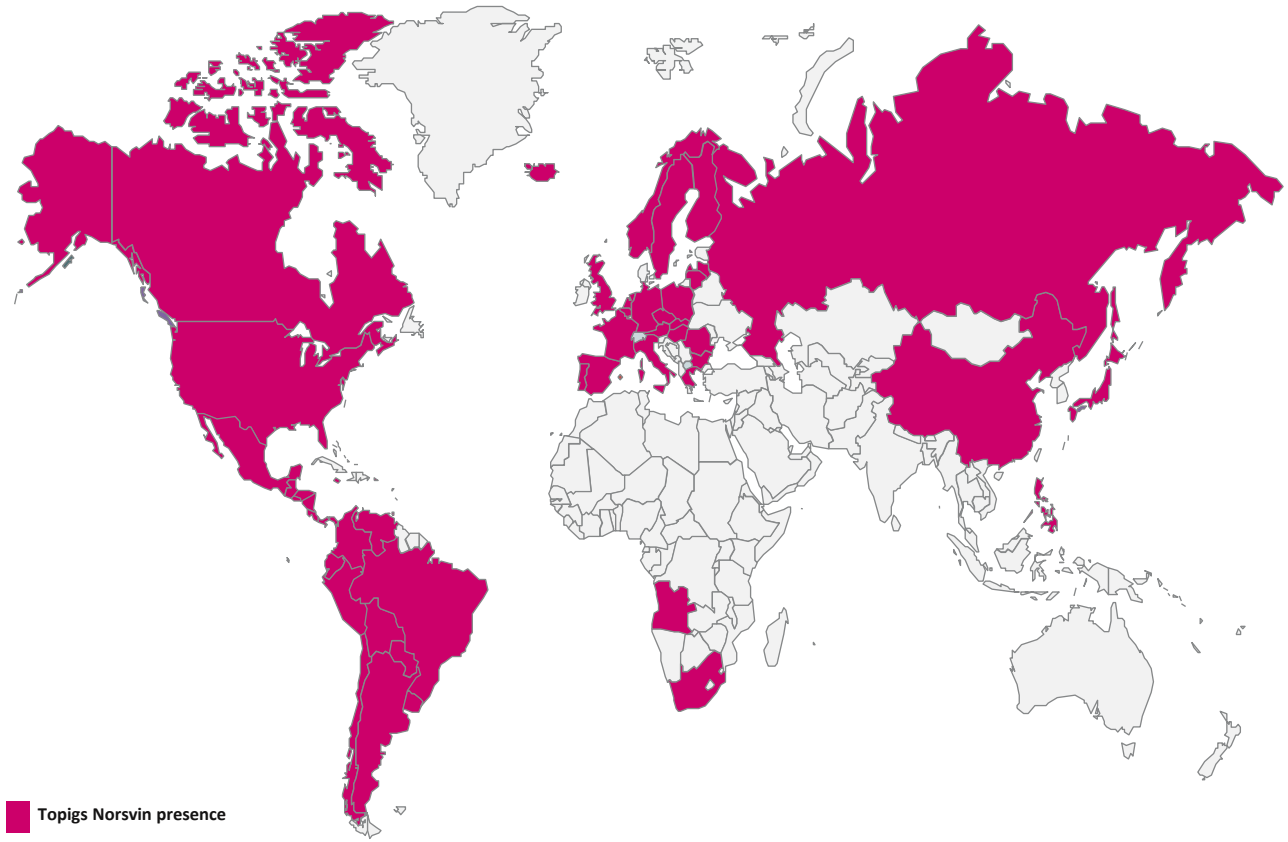
2nd largest swine genetics in the world

650 employees world wide

€ 19 **million** R&D budget

Topigs Norsvin
PROGRESS IN PIGS

Topigs Norsvin with strong global presence in all key markets.



Vision

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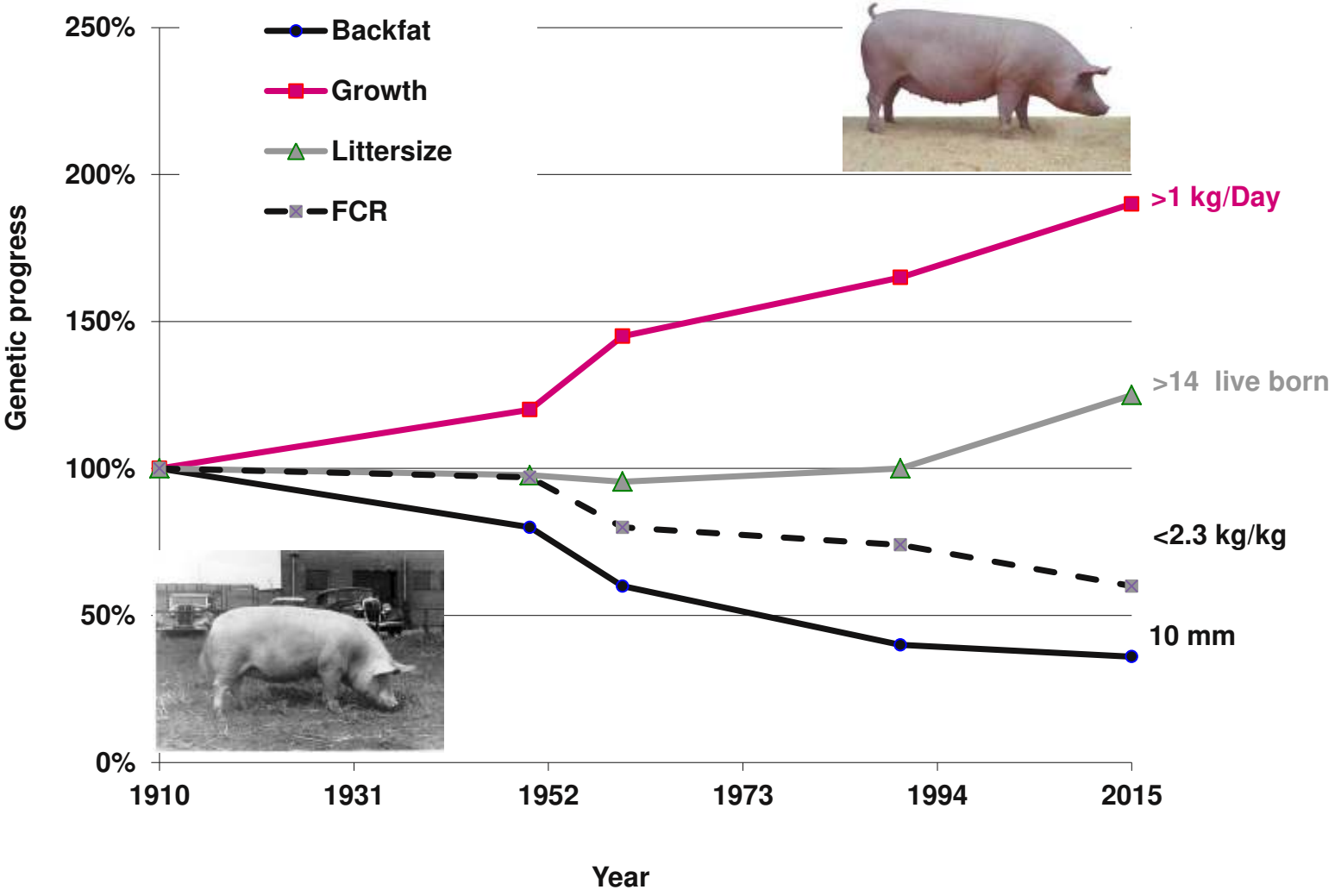

250%
200%
150%
100%
50%
0%
Genetic progress
Backfat
Growth
Littersize
FCR
>1 kg/Day
>14 live born
<2.3 kg/kg
10 mm
1910
1931
1952
1973
1994
2015
Year

Modern breeding techniques for better pigs

Piglet weighing protocol:

- Weighing of newborn piglets.
- Teat counting
- For strong piglets and good mothering abilities.
- Worldwide 700,000 measurements per year.

Individual Feed Intake Registration (IFIR):

- Measurement of individual feed intake per pig.
- For improved feed efficiency.
- Worldwide 20,000 measurements per year.

Live Muscle Scan (LMS):

- Meatiness measurements on living animals.
- For improved meat and carcass quality,
- Worldwide 70,000 measurements per year.

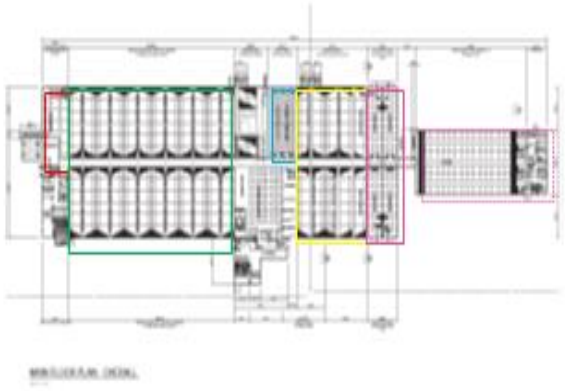
Using DNA information for selection

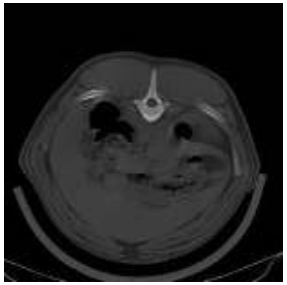
Knowing which specific genetic characteristics are present on the pig's DNA makes breeding faster and better. It also makes breeding for specific characteristics easier.

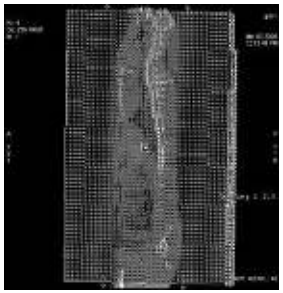
Topigs Norsvin Delta

- 3.000 boars per year scanned
- Also projected in Canada

Delta-2 plan







Delta II Project

- 2 site
  - Nursery/quarantine
  - Boar test station
- $12m project
- $2m annual operating costs
- 15 full time employees
- Genomic selection
- CT scanner
- Feed stations
- High density data collection

Delta Nursery Quarantine Site

4 x 900 head nursery barns

All independent of each other\

All filtered

All in, quarantine and testing period, weekly move out

Central lagoon

Central truck wash

5,000 E line and 10,000 Z line male weaners preselected on litter EBV.

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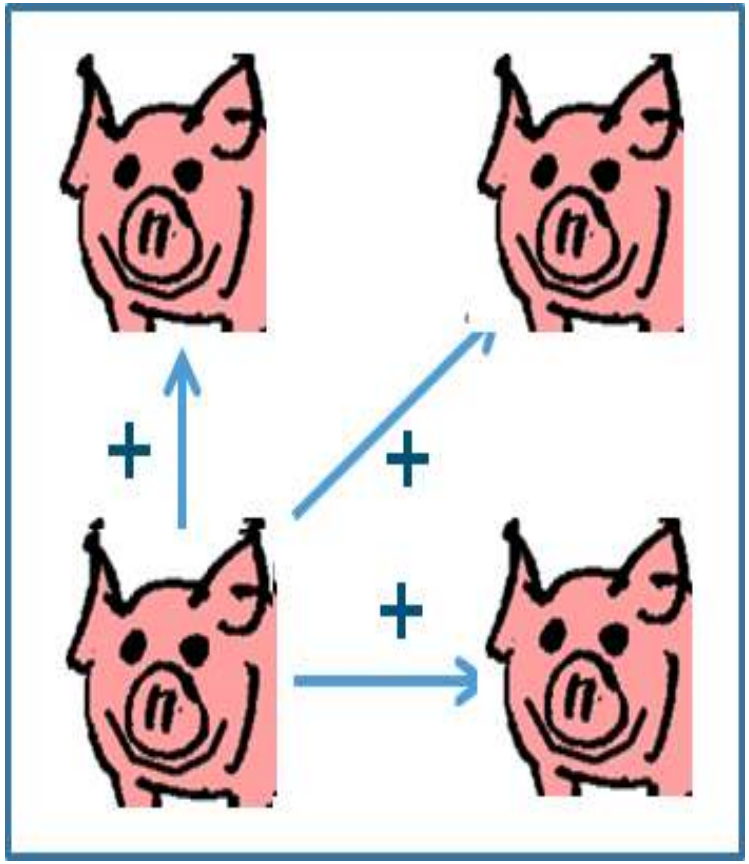
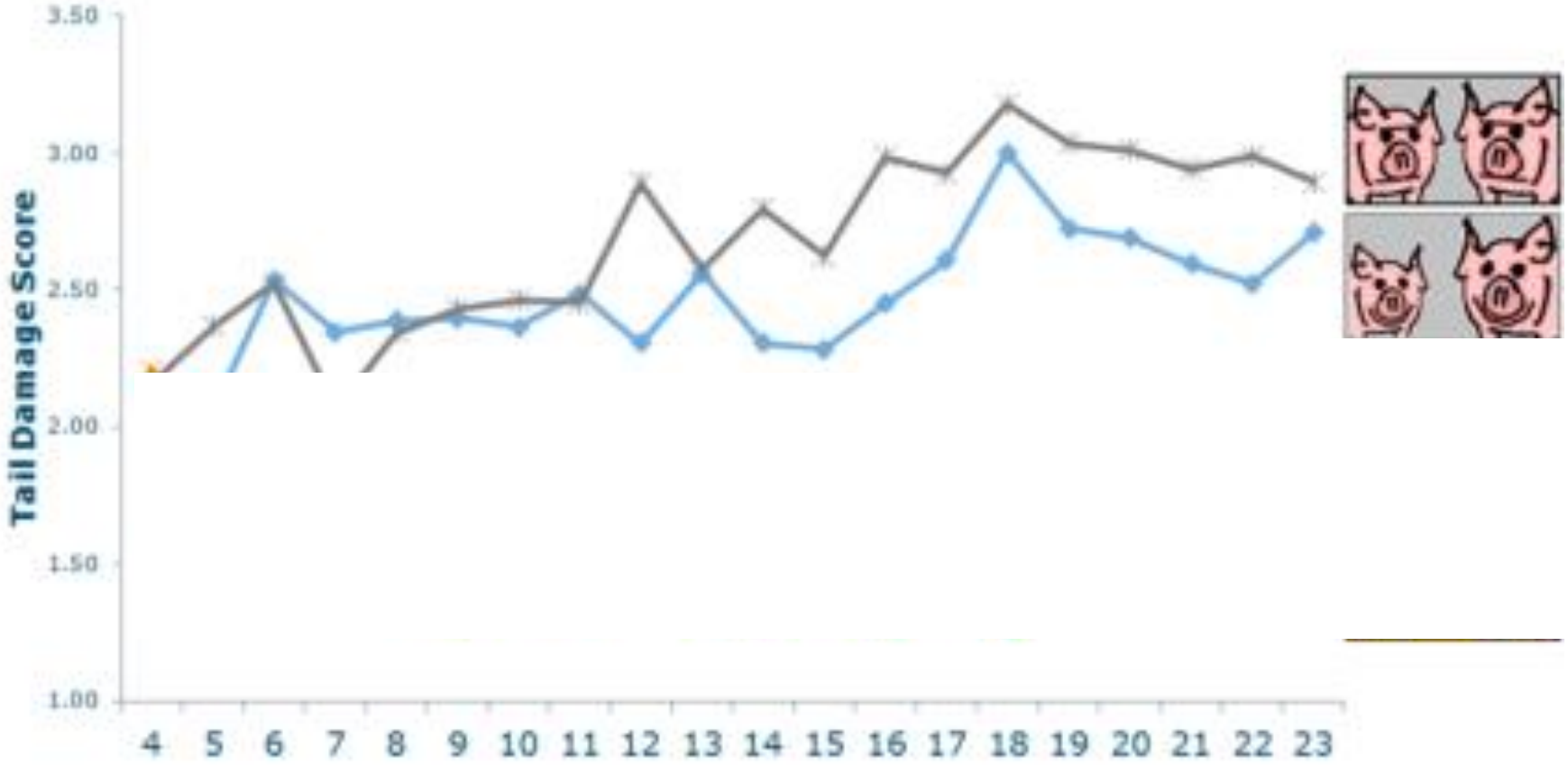
Healthy pigs : “Difficult traits”

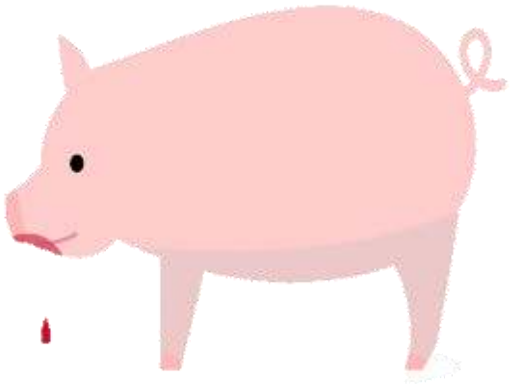
Indirect genetic effects: Higher heritability for Growthrate



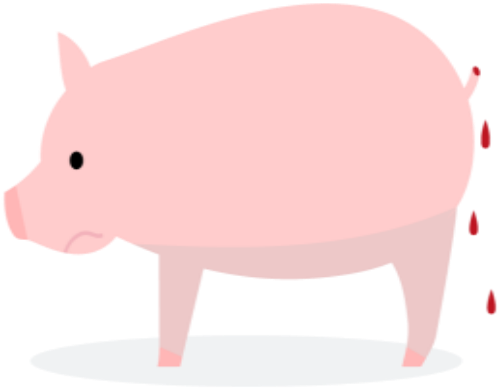
Indirect genetic effect: also decreases tail biting behavior



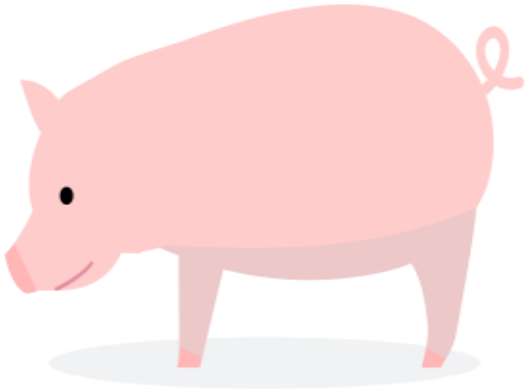
Tail biting behavior



Performer
- Bites
- No visual indication



Victim
- Receive bites
- Tail damage



Neutral
- Doesn't bite
- No tail damage

New: Topigs Norsvin Welfare Index

Selection against slaughter defects

- Bursitis
- Carcass defects
- Lung damages

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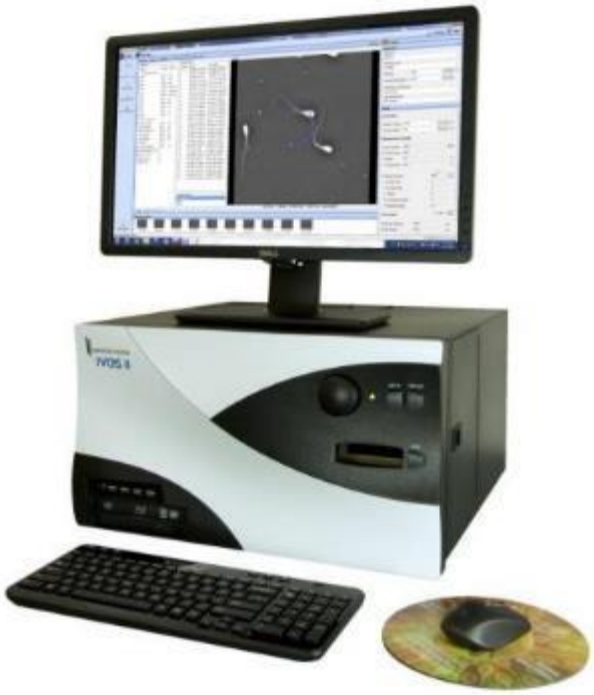
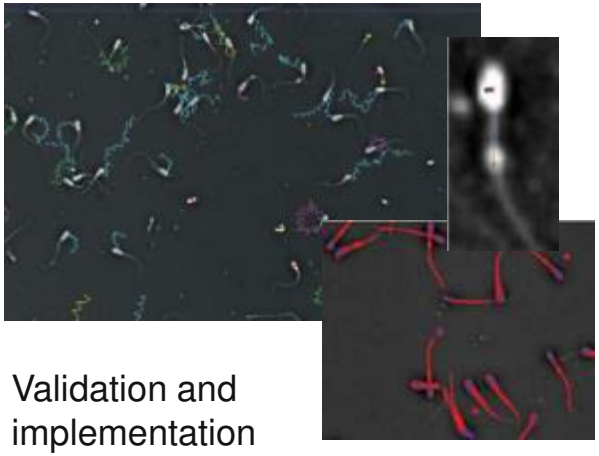
CCTV Camera

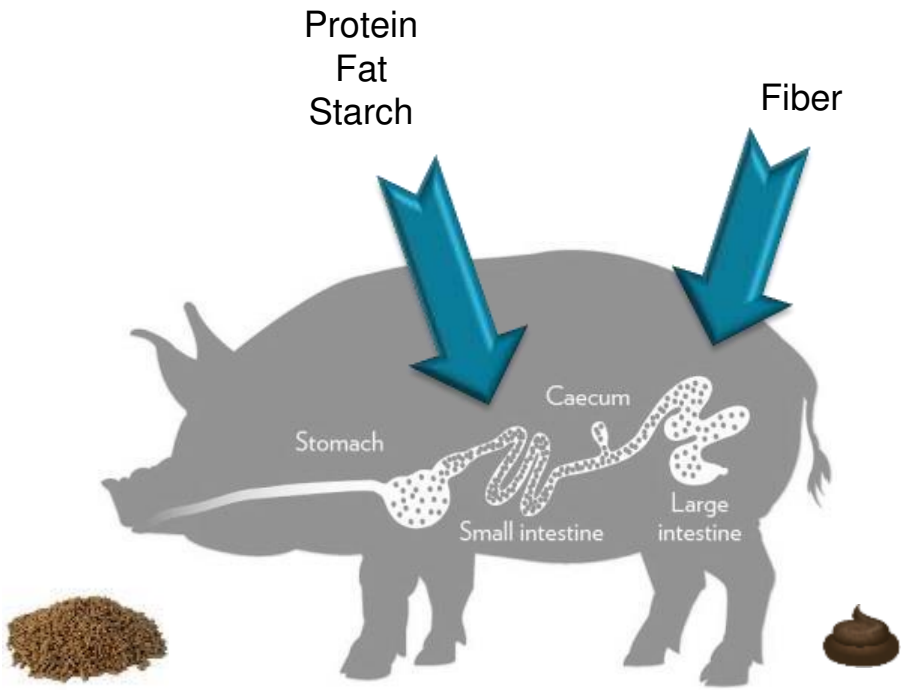
Computer Assisted Semen Analysis



IVOS II
HT Inc (USA) – IMV (France)



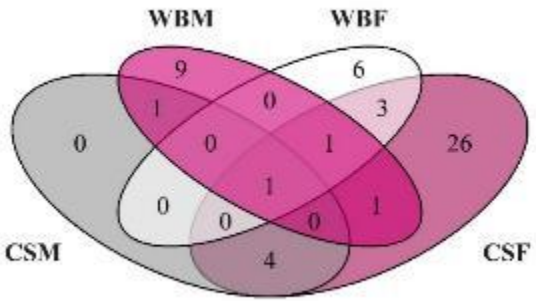
Validation and
implementation

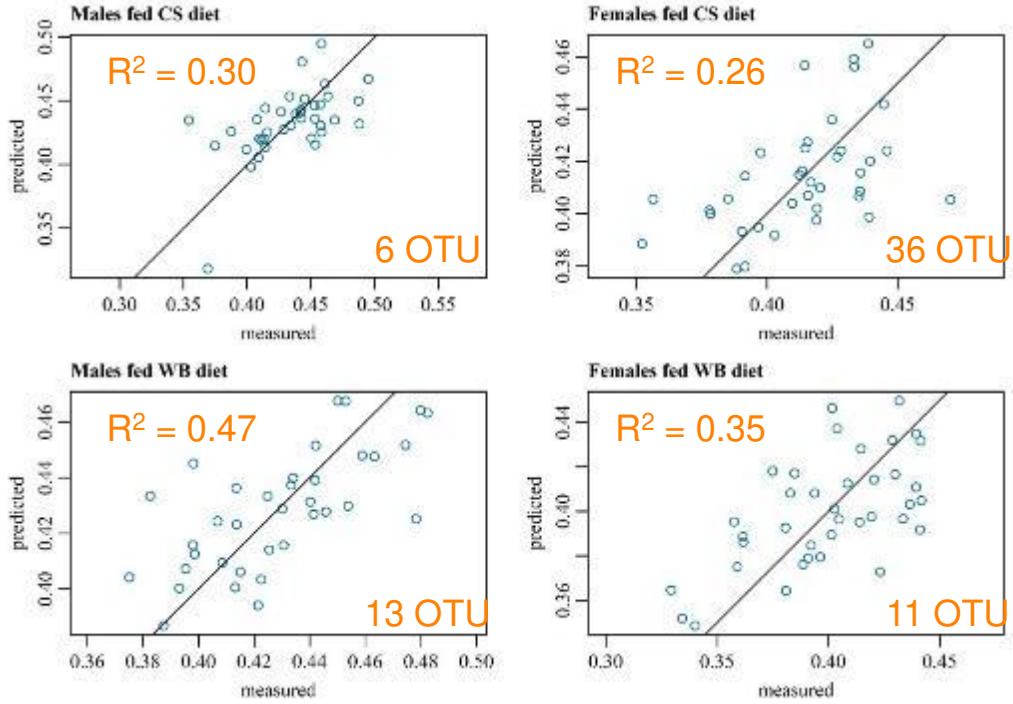


➔ NIR Digestibility!

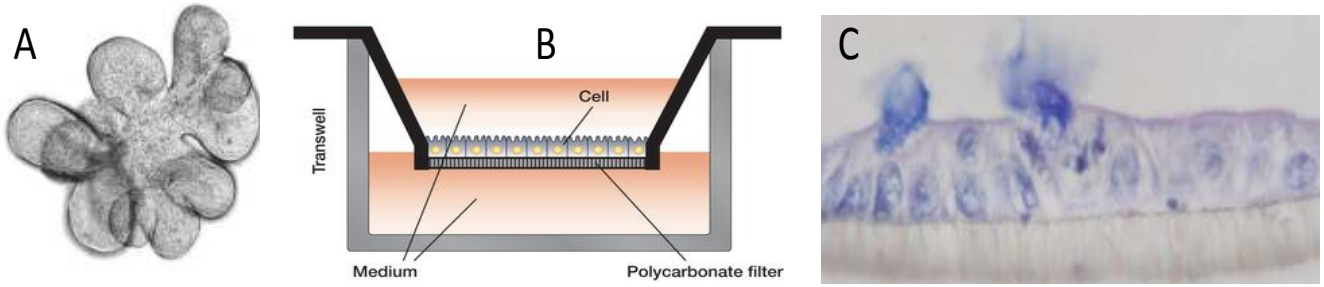
Heritability of feed conversion: 0.25
Microbiability of feed conversion: 0.33!

- Only one OTU in common in all groups
- Unclassified Peptostreptococcae

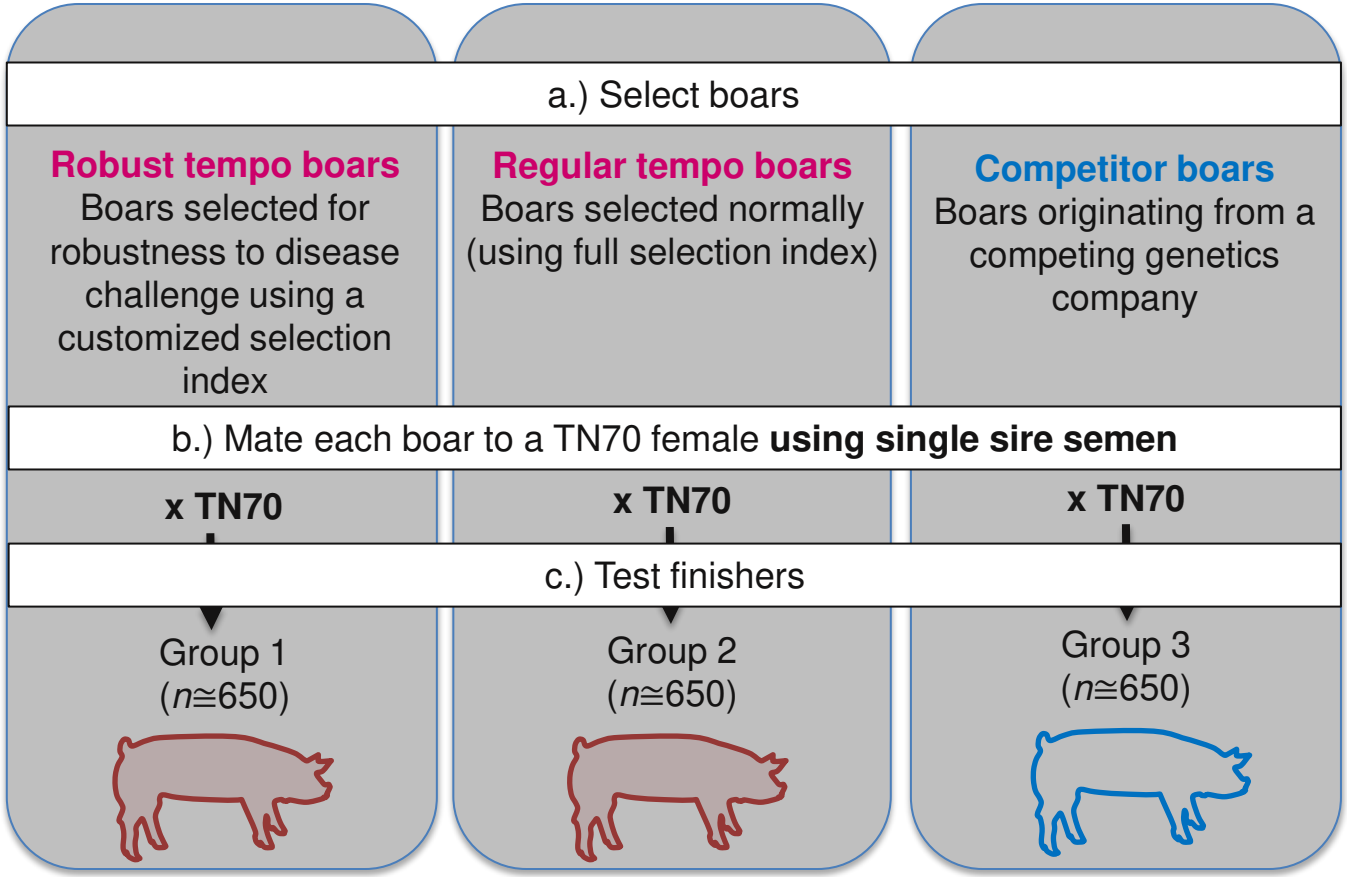




Organoids



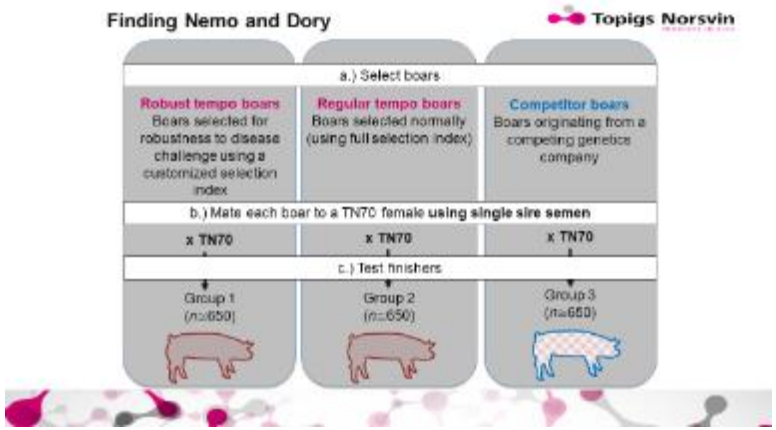
Finding Nemo and Dory



Create golden standard

Microbiome

metabolites



EBV's!!!

Random regression; uniformity; indirect genetic effects; infectivity

Summary

- Last 100 years delta G increased dramatically
- 30 years ago selection on fertility was impossible
- Last 10 years larger computers, better statical models and genomics brought development of new traits for selection
- Next 10 years technologic developments will even go more fast
- Difficult traits like Health will become selectable.

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Thanks for attention.

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