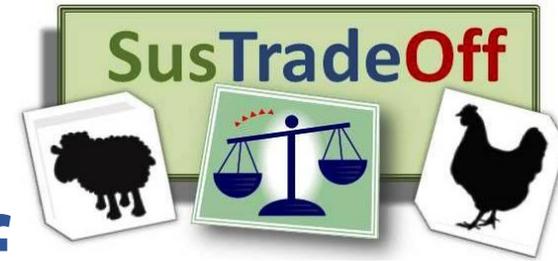




ERA-NET **SUSAN**



SusTradeOff

Understanding trade-offs between health and efficiency to improve competitiveness and sustainability of animal production by breeding and management

Marie-Hélène Pinard-van der Laan

ERA-NET SusAn Virtual Project Seminar
17th November 2020

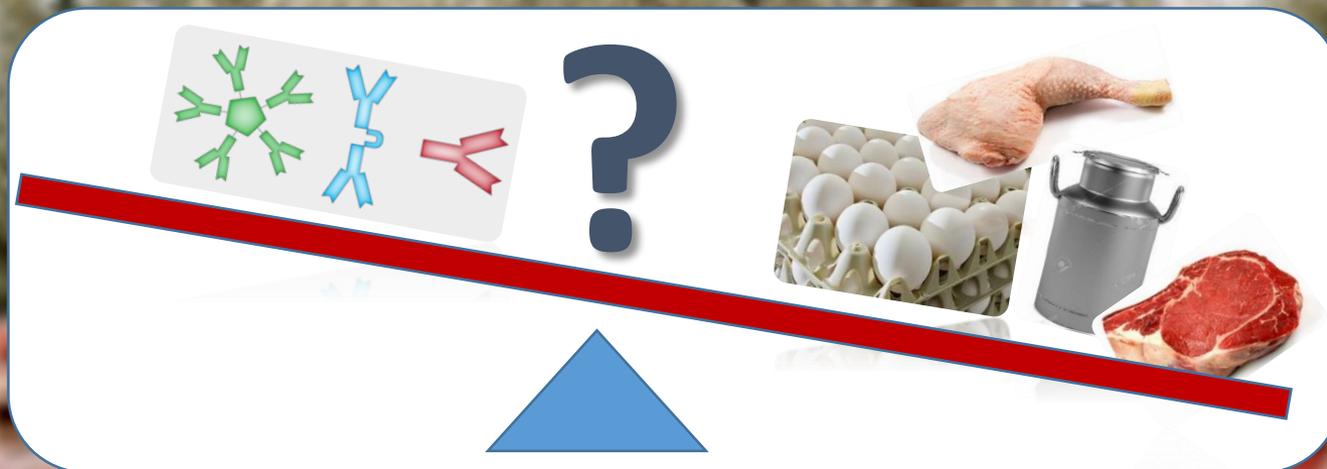


EUROPEAN RESEARCH AREA ON SUSTAINABLE ANIMAL PRODUCTION



The ERA-net Cofund SusAn is funded by European Union's Horizon 2020 Research and Innovation programme under grant agreement n° 696231

Understanding trade-offs between health and efficiency



video



Han Mulder, Tom Berghof,
Marijke Schop, Katrijn Peeters
& Nicolas Bédère

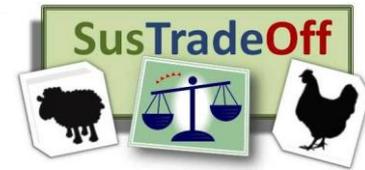


HENDRIX GENETICS

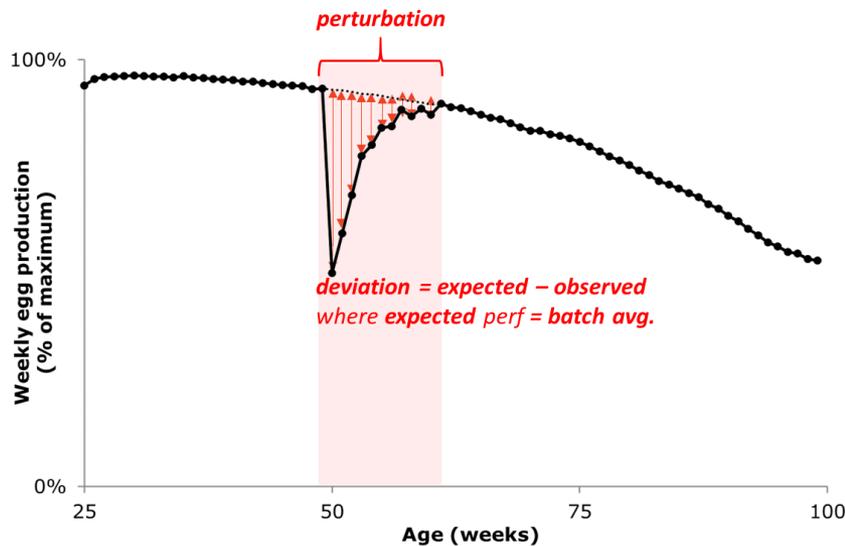
INRAE

Summary of the results

Resilience – what is it?



Resilience: “the capacity of an animal to be minimally affected by disturbances or to rapidly return to the state pertained before exposure to a disturbance” (Berghof et al., 2019).

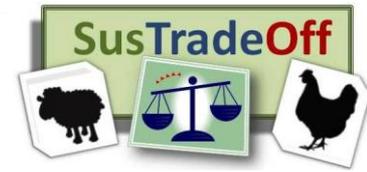


Longitudinal data allow quantifying fluctuations as a consequence of perturbations.

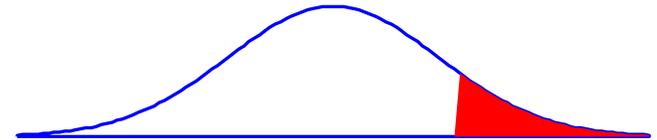
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Indicator of resilience

Main results – Genetic background



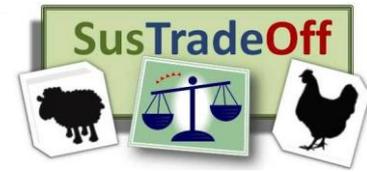
- Resilience indicators based on fluctuations in **Body Weight** and **Egg Production** are **heritable** ($h^2 \sim 0.10$).
- Resilience indicators show substantial **genetic variation**.



Conclusion

There is potential for selective breeding based on resilience indicators.

Main results – correlations & other impact



- Genetic correlations between resilience and other traits are in general favourable.
- Environmental and economic impact of selection for resilience
 - ✓ no detrimental effects on GHG and Land Use*
 - ✓ negligible economic effects.

**Food-feed competition was not accounted for*

Conclusion

No apparent negative side effects of selection for resilience.

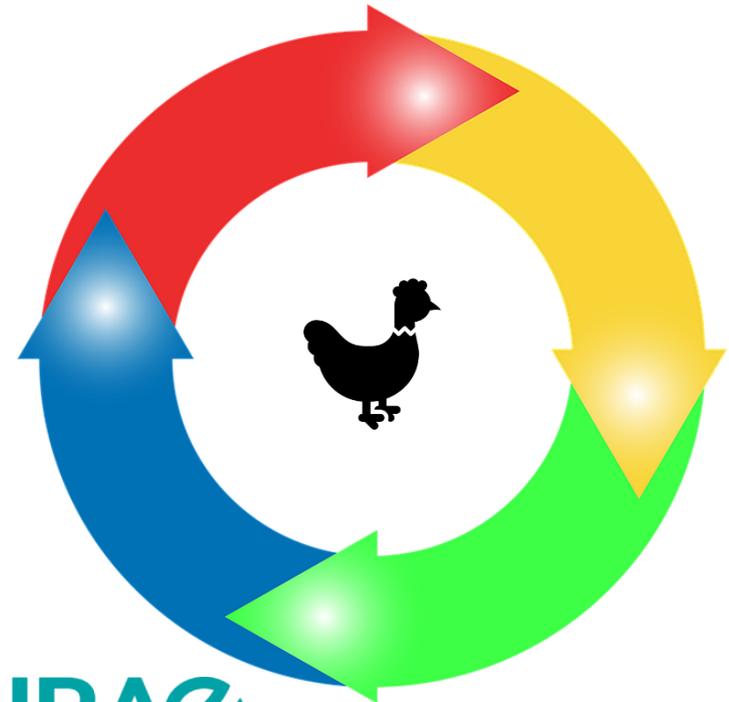


Main results – circular food system



Role of laying hens in a circular food system?

Feed intake capacity of laying hens seems a limiting factor in converting wet waste stream products into animal protein.



Main results – Hendrix Genetics



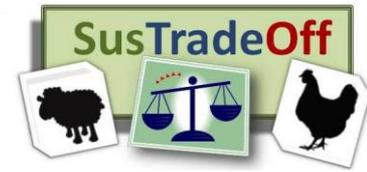
- Basic understanding on the genetic architecture of resilience traits (incl. correlations), both in pure- and crossbreds.
- Insight into the environmental and economic impact of selection for resilience traits.



Future research needs

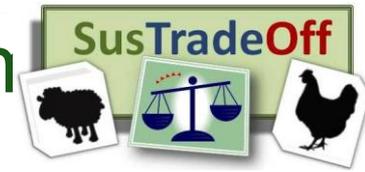
***contributing to sustainable
animal production systems***

Future research - resilience

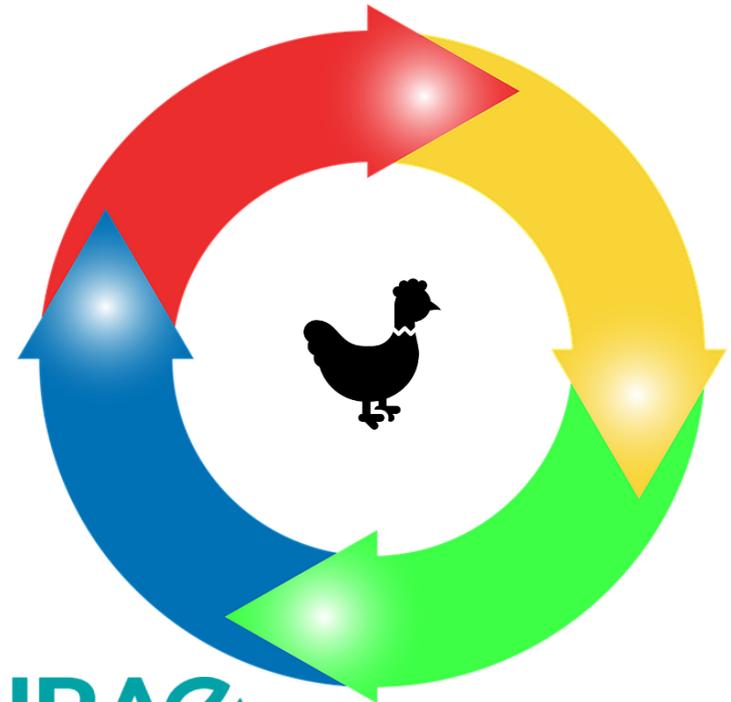


- Other resilience indicators
 - eggshell characteristics and egg weight – fast responders to environmental perturbations.
- Resilience indicators under challenging conditions (GxE).
- Biological characterisation of resilience indicators
 - Under current housing conditions no relation between resilience and immunity.
 - What are we selecting for?

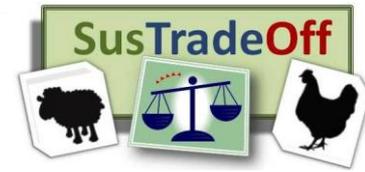
Future research - circular food system



- Model the role of layers in circular food systems when optimising for environmental impact.
- Experimental data on productivity of laying hens on low-opportunity cost feed.



Future research – Hendrix Genetics



- Cross-validate:
Does selection of laying hens based on **resilience indicators** result in more resilient offspring?

