# Resilience of Livestock production systems

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|---|---|
| 9:30- 10:00 | Meet and Greet |
| 10.00 | **Gert van Duinkerken**, Chairman of the symposium and Business Unit Manager of Wageningen Livestock Research |
| 10:05 | Opening by **Ernst van den Ende**, Managing Director of the Animal Science Group |
| 10:20: | Animal resilience: Health, Disease & Animal centred husbandry systems: **Ingrid van Dixhoorn** |
| 10:40 | Adaptation to heat stress in dairy cows, **Brigitte de Bruijn** |
| 11:00 | Climate resilience of dairy farms on sandy soils, **Marion de Vries** |
| 11.20 | Short break |
| 11:45 | Ethical choices in relation to resilience, **Heleen van Kernebeek** |
| 12:00 | Resilience thinking in an integrated landscape approach **Barteld Vervelde & Menno Diersmann** |
| 12:15 | Wrap up and discussion |

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# Resilience of Livestock production systems

January 29th, 2024, Ernst van den Ende

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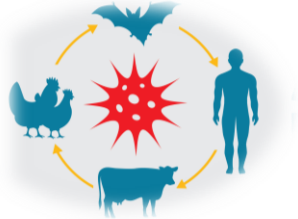
# Challenges

- **Climate change**
- **Antimicrobial Resistance**
- **(Zoonotic) diseases**
- **Bio-diversity**
- **Water shortage**
- **Societal values**
- **……**



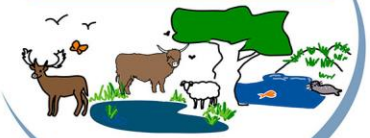
CHALLENGES

FOCUS

Animal welfare in sustainable food systems

Human & animal health in mutual interaction

Biodiversity & ecosystems



# Focus on animals

EXCELLENT SCIENCE & EDUCATION
ON FUNCTION, BEHAVIOR & BIOLOGY OF ANIMALS

Projects and programs aligned with areas of focus

Training students to become experts with an integrated perspective

Solutions that contribute because we listen

Independent and transparent research

Innovative technologies & methods

A stimulating working environment: system approach and mission driven

Collaborating inside & outside WUR

CHOICES

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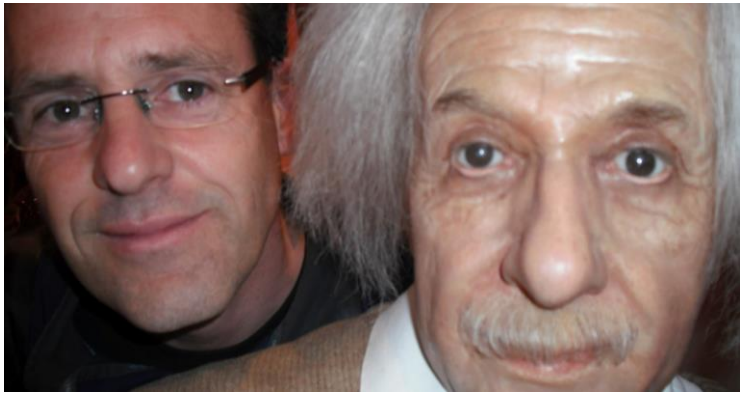
# Resilience

Resilience is the capacity of a complex dynamic system to adapt to changes and continue to function and develop (Holling, 1973)

The ability to be minimally affected by disturbances **AND/OR** to quickly recover (Colditz & Hine, 2016)

We cannot solve our problems with the same thinking we used when we created them
*Albert Einstein*

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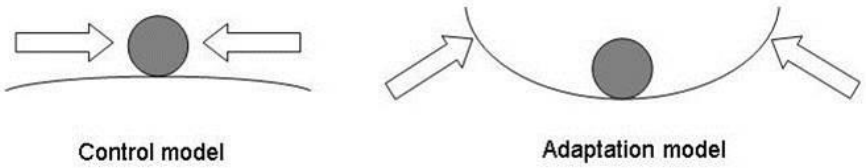
# Two strategies to cope with disturbances:

- **Control Model**: Focus on causes
- **Adaptation Model**: Focus on consequences

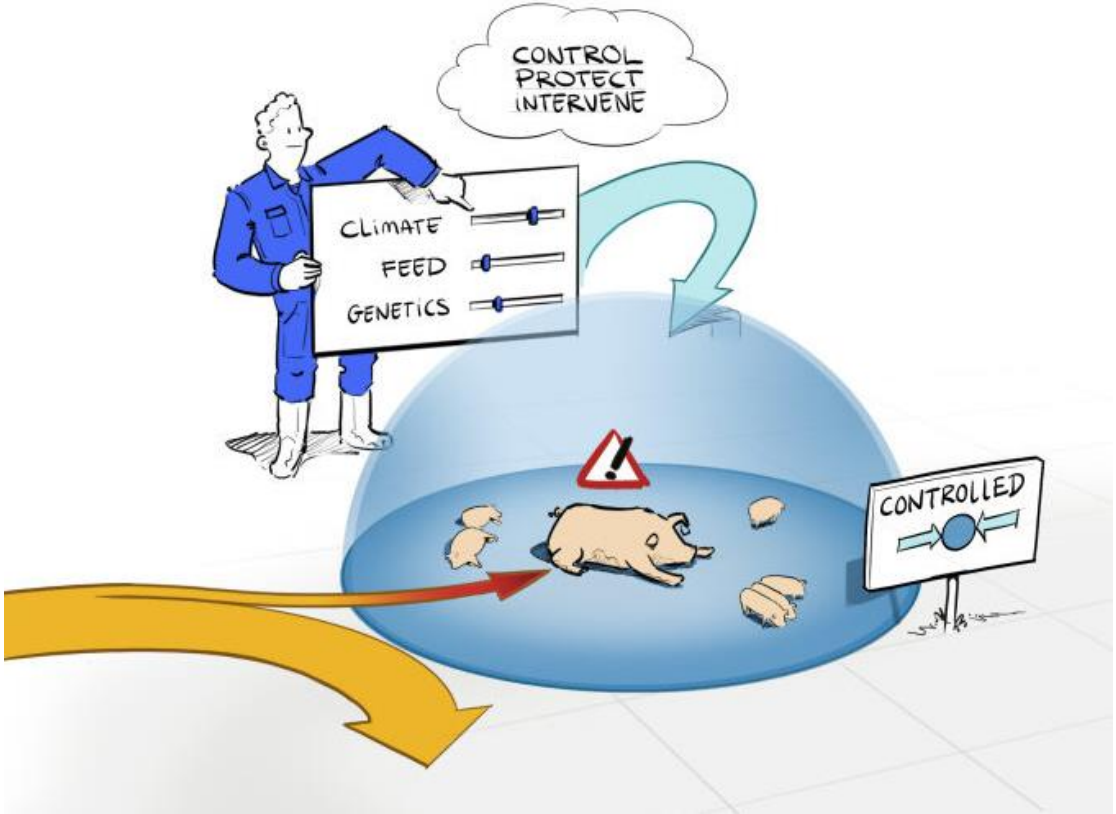





Ten Napel et al., 2006

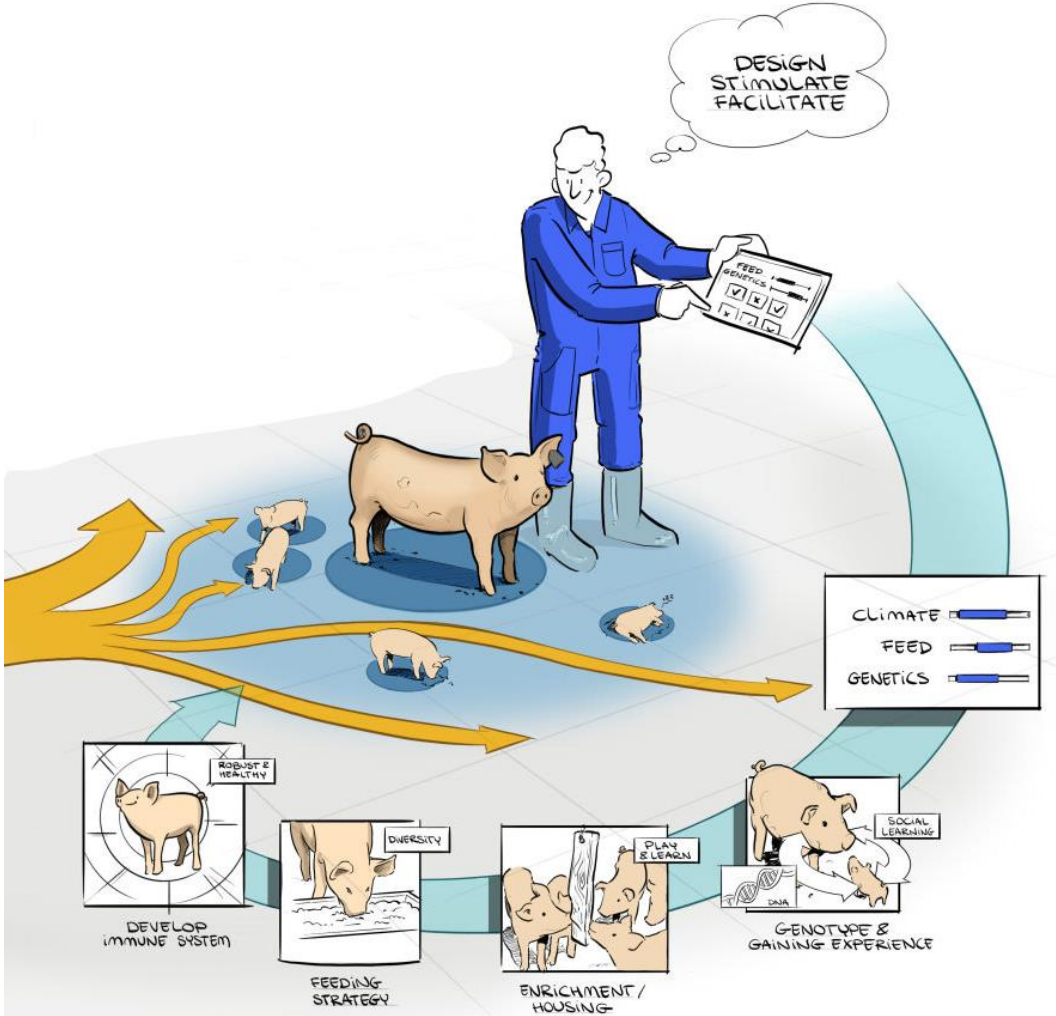
# Control model at animal - farm level

- Protect
- Monitor
- Intervene



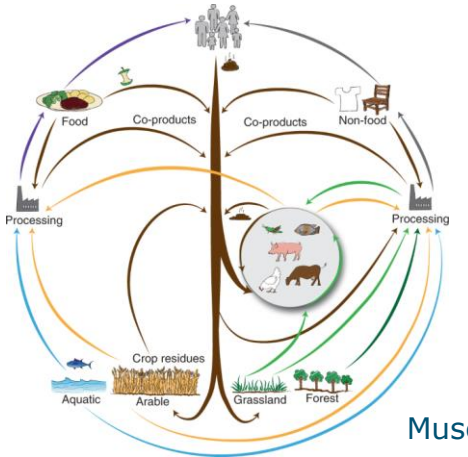
# Adaptation model

- Mitigate consequences
  - Design
  - Learn & Train & Support
  - Adaptation
  - Transformation



# Resilience related to other system levels, time scales and other concerns

- In research system boundaries can be set and examined
  - Possible Physiological, Technological, Management, Design solutions
  - Estimation of consequences and impact
- In real life interactions go beyond system boundaries and time scales

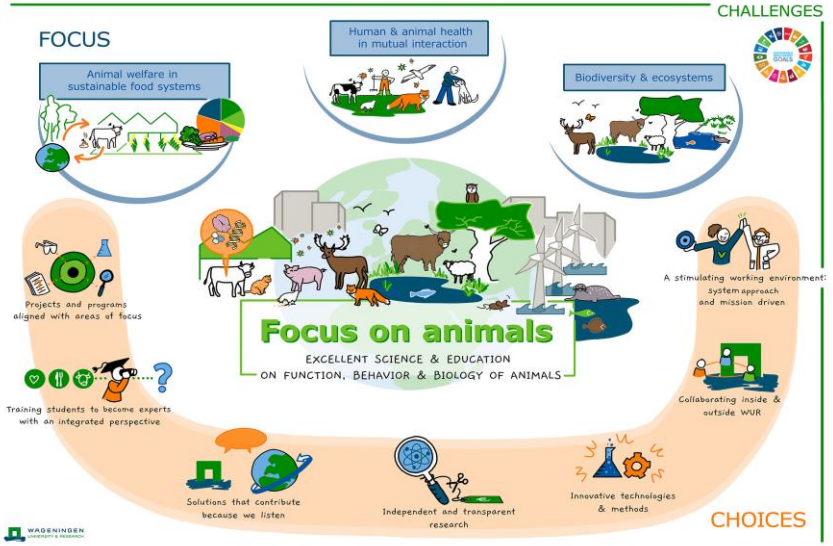



Muscat et al. 2021

- Dilemma’s: to utilize resilience in future food production systems while at the same time choices we make depend on societal concerns, ethical choices, and other values

# With this symposium we aim to stress

- Need to expand collaboration
- Join forces
- Reconsider possible diverging values within the dilemmas and search for acceptable and future-proof science-based solutions.

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