

EU-PLF Project: Bright Farm by Precision Livestock Farming

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Overview

- Challenges for Livestock Production
- What is Precision Livestock Farming (PLF)?
- Where is PLF today: Examples of PLF
- Conclusions

M3-BIORES team



253 A-Publications
359 Conf papers

16 products
2 spin-off companies

15 patents

EU-PLF – Bright Farm by Precision Livestock Farming



EU-PLF Partners



EU-PLF Advisory Board



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Challenges for livestock production

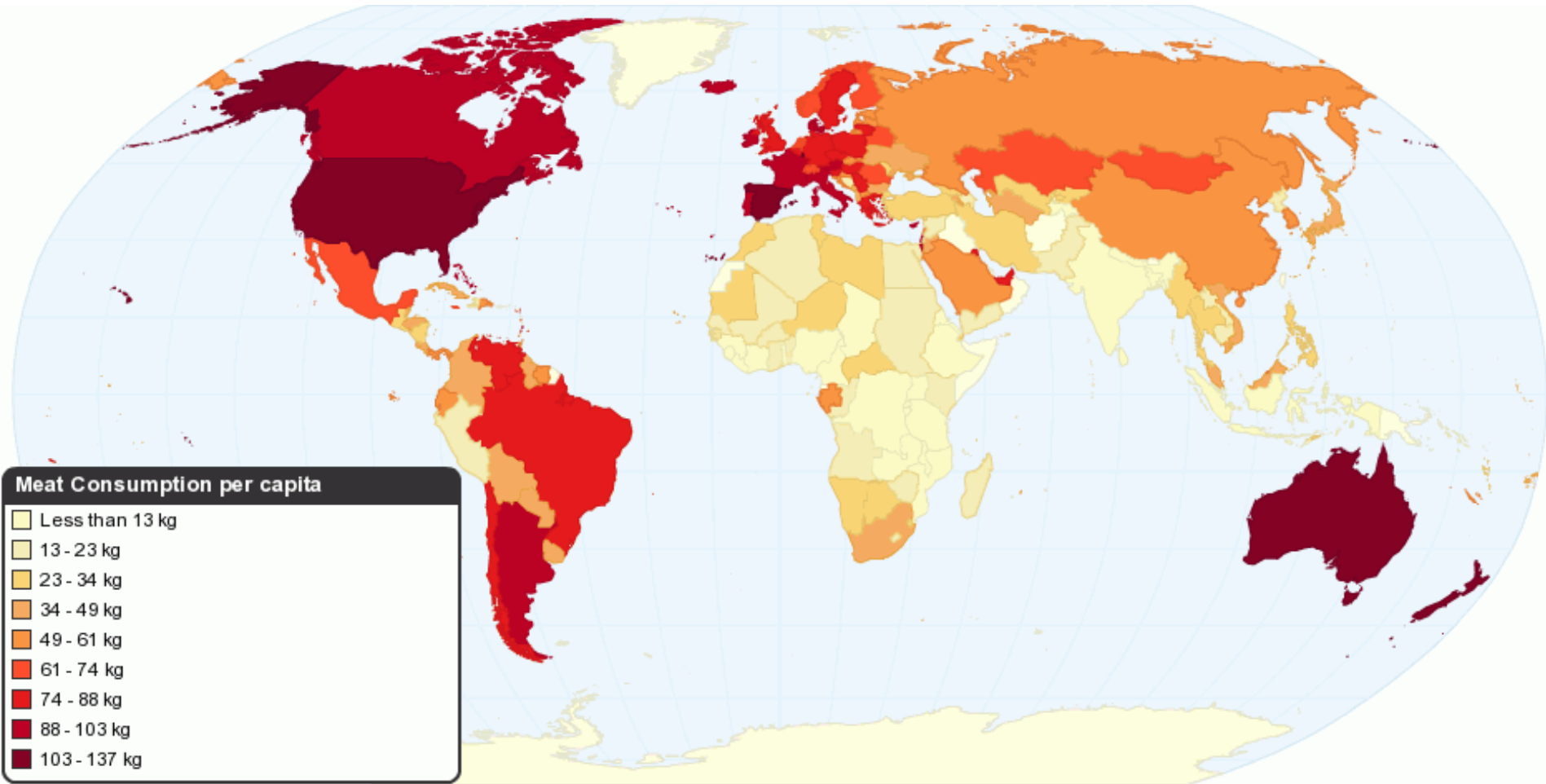
Problem of monitoring animals

- Livestock farming in the past ...



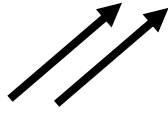
Farmer had the time to use audio-visual scoring

Worldwide Individual Meat Consumption

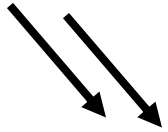


Source: FAO (2010)

Numbers of animals



Number of farmers



Resulting in



↳ High number of animals per farm

↳ Less available time per individual animal

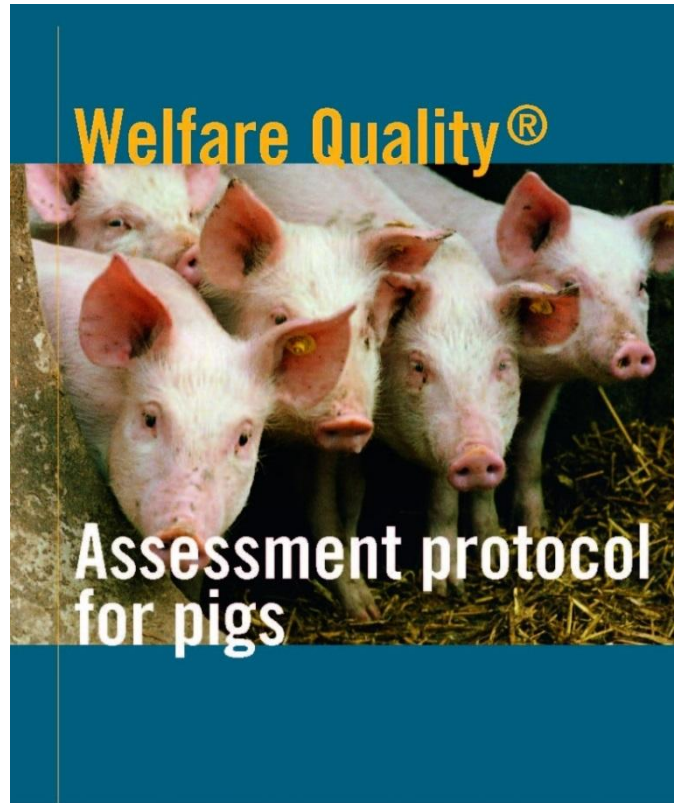
↳ More welfare and other problems

Challenges for livestock production

- Over 60 billion animals are slaughtered every year, increase with up to 40%?
- **Health:** Relationship between animal health and healthy food
- **Animal welfare** (e.g. EU)
- **Environmental Issues**
- **Social importance**
- **Economic importance** including Valorisation of knowledge

3 approaches in European focus on animal behaviour

First approach: Welfare Quality (1)



Europe has invested in a methodology to quantify Animal Welfare “Welfare Quality”

Procedure: Experts do audio-visual scoring by visiting farms and looking to (behaviour) of **animal**.

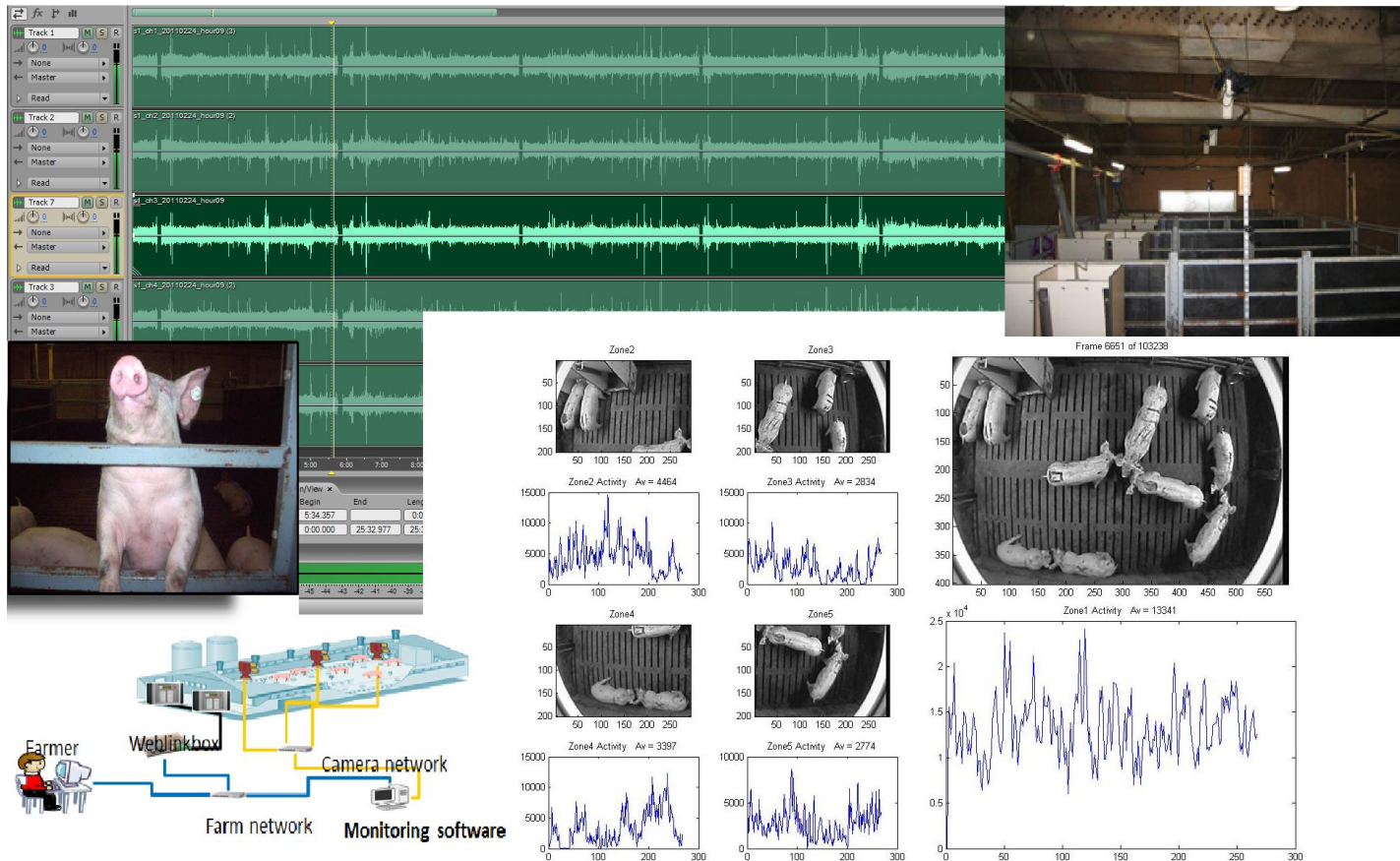


Second approach: Iceberg Indicator (2)

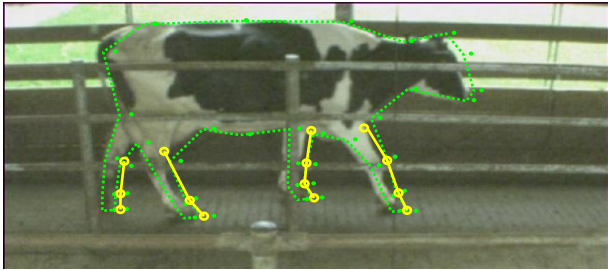


Tomorrow...Automated Systems

Technology can help to quantitatively measure **behaviour**, **health** and **performance** of animals.



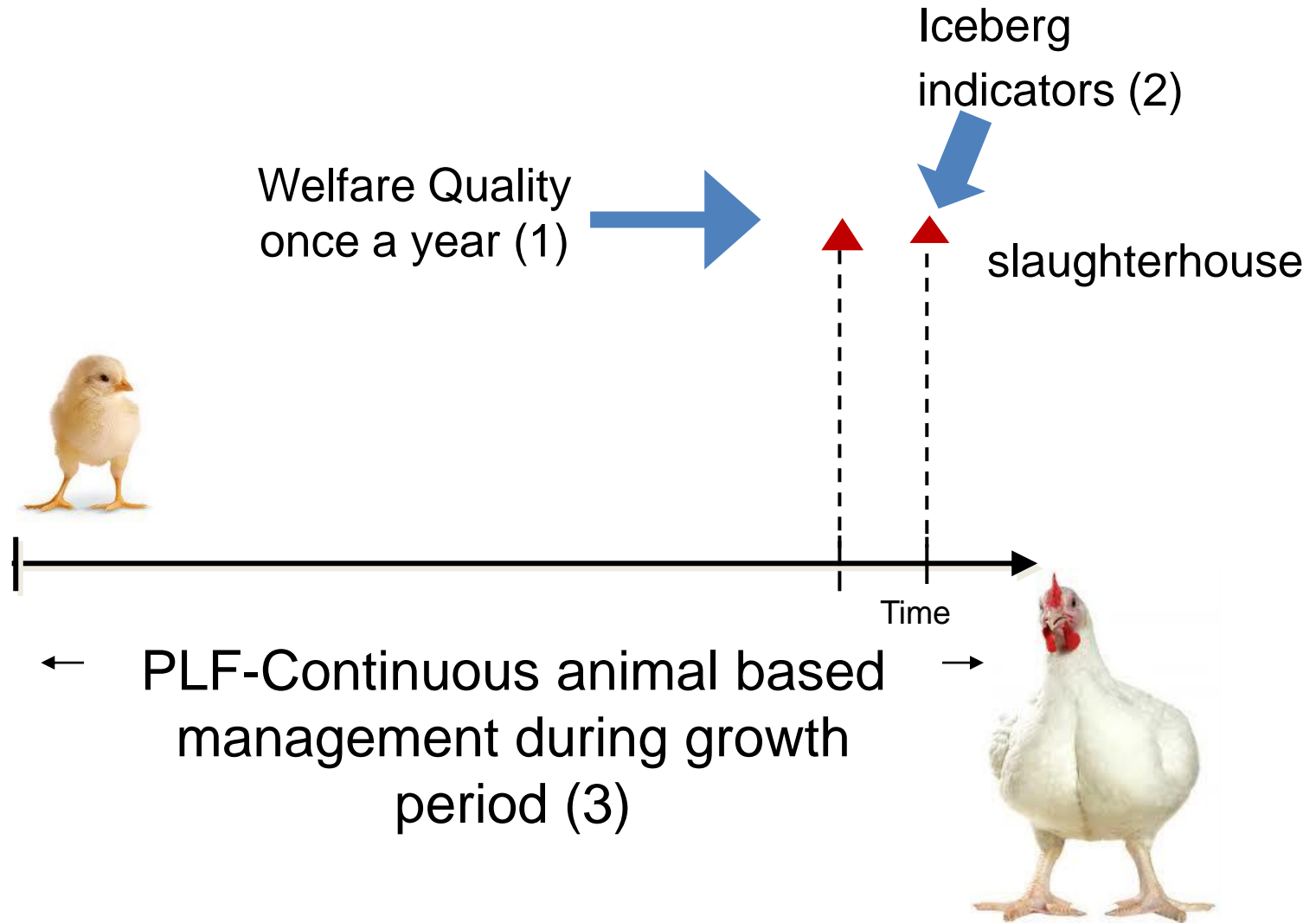
Third approach: Precision Livestock Farming (3)



Management of livestock by continuous automated real-time monitoring of production/reproduction, health and welfare of livestock and environmental impact.



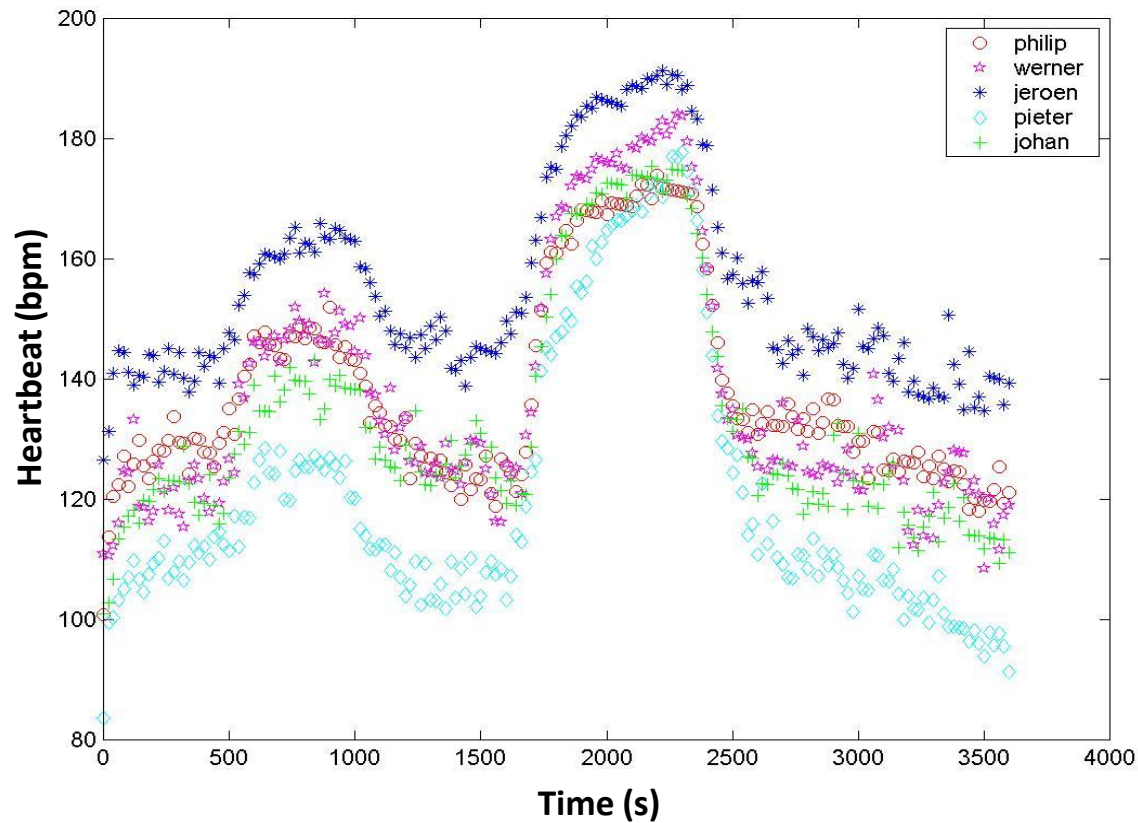
Welfare Scoring/Monitoring



A living organism:

Complex

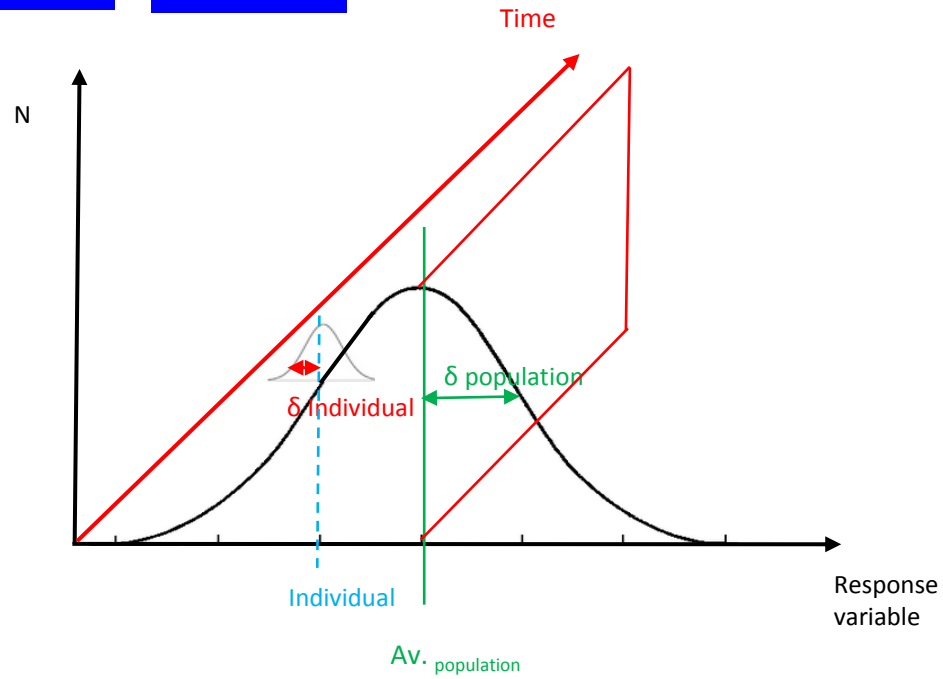
Individual



A living organism:

Complex

Individual



A living organism:

Identical

Individually different



A living organism:

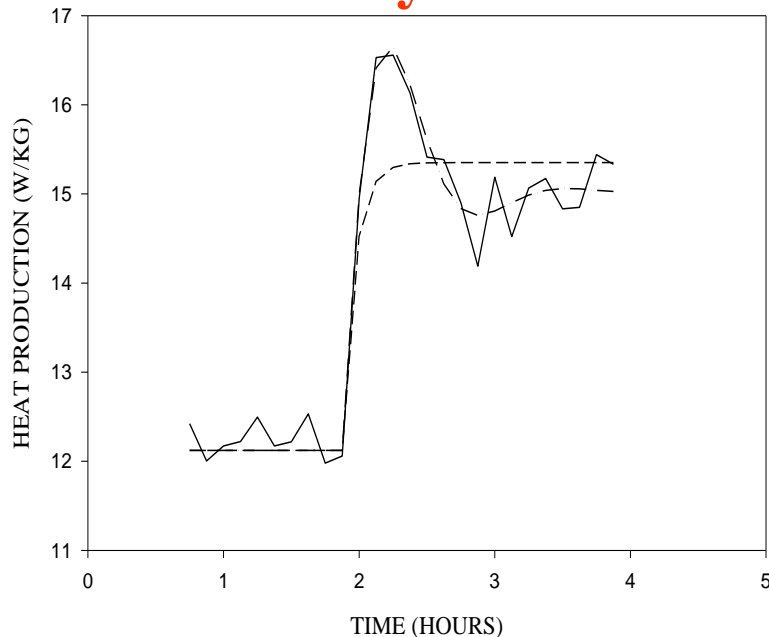
Complex

Individual

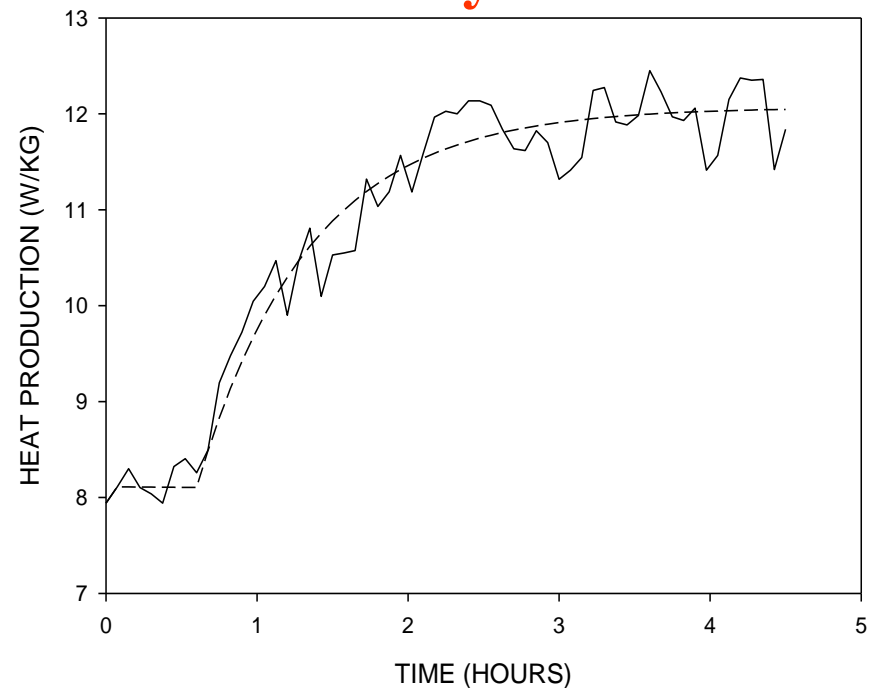
Time-Varying

Example: Heat production of broiler chickens

5 days old



30 days old



— MEASURED
- - - MODELLED (1ST ORDER)
- · - · MODELLED (2ND ORDER)

— MEASURED
- - - MODELLED (1ST ORDER)

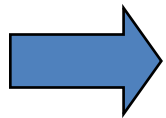
A living organism:

Complex

Individual

Time-Varying

Dynamic



Living organism = **CITD** - system

1. Measure

2. Model

3. Manage &
Monitoring

In an on-line way

M3-BIORES

Examples of PLF Technology: What is possible today?

Fully automated monitoring

Infection Monitoring by On-line Pig Sound Analysis

i.c.w. University of Milan, SoundTalks NV, Fancom BV



Health monitoring by on-line sound analysis:

On-line cough recognition algorithm in pig stables

