Challenges and Opportunities Tools of Smart Livestock Farming



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Saxon State Office for Environment, Agriculture and Geology

Teaching and research farm Köllitsch



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LfULG, O. KUNZE

Challanges for animal farmers Today and in the future

- I lack of professionals
- societal ideas and demands
- consumer behavior
- orientation of agricultural policy
- regulations and documentation requirements
- climate change
- socio-ecological market economy



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LENK, 2020

Challanges for animal farmers To-do list

- Managing competition for the resource of employees
 - creating an attractive workplace
 - Competitive pay and appreciation
- compensation lack of professionals in service by themselves
- get societal acceptance
 - change in animal husbandry
 - get trust
 - use popular media

TO DO LIST	
	TO DO LIST



- Production of high-quality products at consumer-friendly prices
 - healthy and high-performing animals
 - continuous production process optimization
- compliance with legal requirement
- Strengthen operational resilience to changing climatic production conditions
- continue to operate sustainably and environmentally friendly

Digital assistants in the barn and in processing products

Tools in Workflow



Automated egg sorting/packaging (Krieger AG, 2024)



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Automated milking carousel (LKNRW, 2021)

Tools in Workflow



Automated mobile poultry house (Big Dutchman, farmmobil, 2024)



Tools in Workflow



Automated calf feeding system (LfULG, 2022)

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Feeding robot (LKNRW, 2021)



Automatic feeding system (Meyer LfULG, 2015)

Tools in Workflow



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HERDE mobil (LfULG, 2021)

Animal Health and Fertility Controlling

activity rumination localization eating time body temperature pH value of rumen LfULG, 2023

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body condition scoring



Animal Health and Fertility Controlling





Animal Health and Fertility Controlling





Animal and Product Controlling



Pig scale with 3D camera and selection (BW Agrar)

Weight control to assess the success of fattening and health management

body condition scoring



Mobile pig scale with 3D camera (Hölscher & Leuschner, 2024) 12 | 16.12.2024 | Franziska Deißing







Automated body condition scoring (Dorsch, 2018)

Daily waith gain- front leg scale (LfULG, 2024)

Animal and Product Controlling

assessment of milk quality, milking process, and animal health

Tools for Barn Climate Management

Ventilation control (LfULG, PACHE, 2020)

Climate sensors (LfULG, 2020)

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Fans (LfULG, PACHE, 2024)

Challanges for Animal Farms Today and in the Future

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What's the catch?

- I lack of interoperability
- I incomplete decision support
- user-friendliness
- technology maturity of some systems
- quality of service (manufacturer and dealer)

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Interoperability

Identification

Interoperable with RFID (LfULG, 2024)

Internal system ID (LfULG, KEWITZ 2023)

Interoperability

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Interoperability

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Decision Support an User-Friendliness

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GRIMM, 2023

What's the catch?

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weather

dirt

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energy

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sun

animal behavior

What's the catch?

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Quality of Service

- regional service
- communication between dealer and manufacturer
- creating self-help opportunities

New Opportunities

Image Analysis Systems

3D measurement of cows for locomotion scoring

(Cattle Eye, 2022)

CBS 3D-Vermessung (Dorsch, 2018)

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Optical animal identification

(LfULG, 2020)

New Opportunities with technological progress Image Analysis Systems

Feeding control – How much eat the cow?

Animal behavior

Cattle Feed Intake System (VikingGenetics, 2024)

New Opportunities with technological progress More Ideas

Tracking

- I location and time \rightarrow What is the cow really doing?
- AI 3D modeling
- Acoustics
- background noise
- detection of deviations
- High frequency data
- challenge: improved energy management of the sensor system
- bio-rhythm of a cow

New Opportunities with technological progress VR and AR tools

- tools for self-help
 - expansion of skills
- effective tool for herd management
 - enhanced information availability
- teaching of animal welfare-related skills

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CowControl (Nedap, 2018)

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VR and AR teaching tools (LfULG, 2023)

Thank you for your attention!

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The LfULG in Köllitsch Projects in Digital Farming

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Themenverbund Digitalisierung Landwirtschaft