# IOF2020 DAIRY TRIAL EXPERIENCES



### Kees Lokhorst

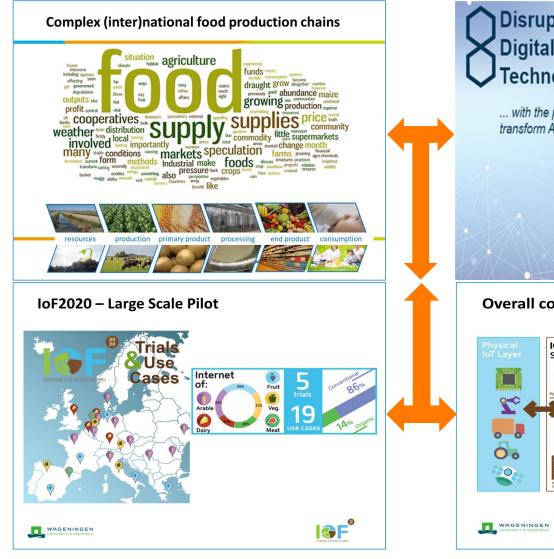
Ecosystem chair of the Dairy Trial

Wageningen Livestock Research

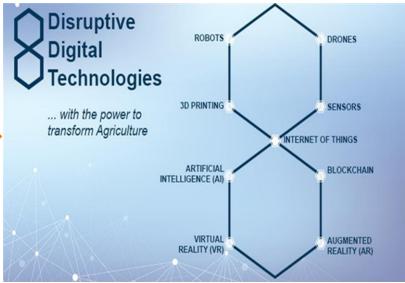
IoF2020 Solutions for Farmers: How IoT helps your Farming Activity? (LSP) IoT week Aarhus: June 19<sup>th</sup> 2019



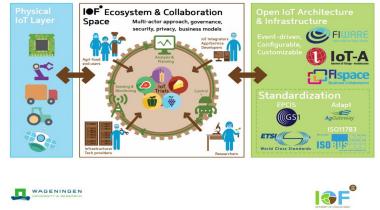
## Short introduction of IoF20 Dairy Trial



WAGENINGEN UNIVERSITY & RESEARCH

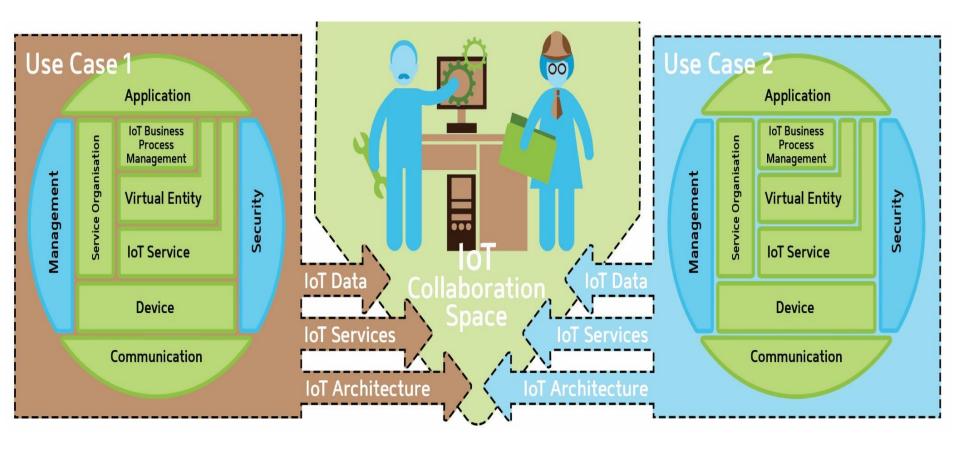


### Overall concept for 4 year, 30M€ project





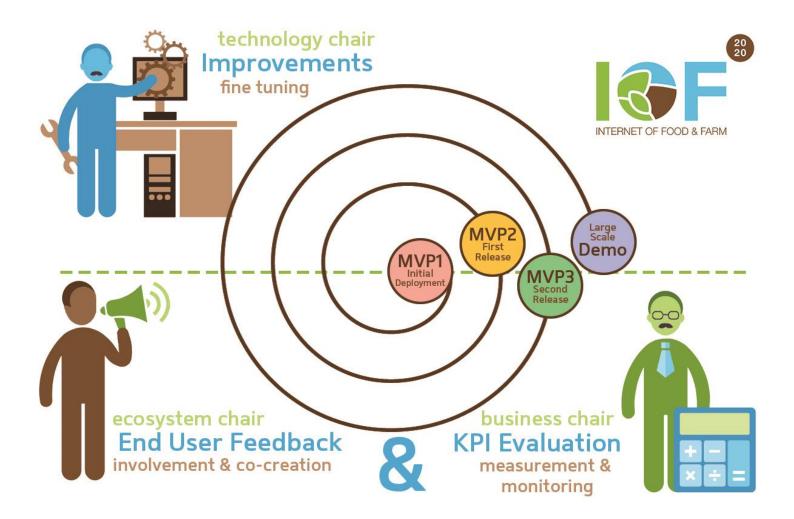
# **Expected SYNERGY between USE CASES**







## Overall methodology

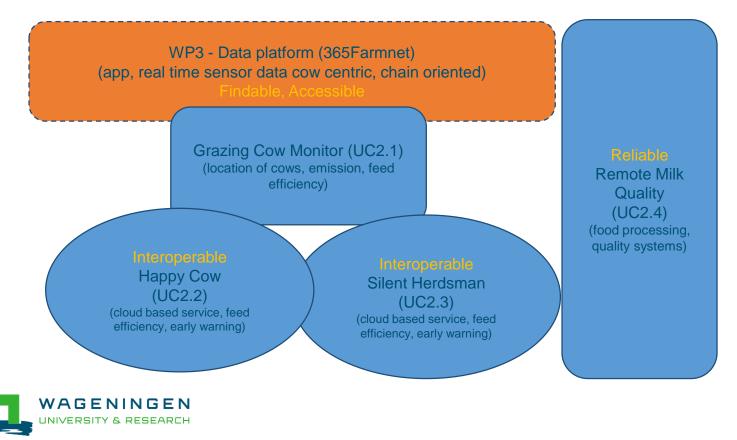






## IoF20 Dairy Trial

The goal of the DAIRY trial is to implement, experience and demonstrate in some EU-countries the use of real-time sensor data from 'grass to glass' to create value in the dairy chain by applying the FAIR (Findable, Accessible, Interoperable, Reliable) principle. It will benefit health, welfare, environment and resource efficiency





## IoF20 Dairy Trial Status in 2019

**Grazing Cow** 

Monitor (UC2.1)

(location of cows in a

free grazing

environmenty)

UC oriented

Reliable

**Remote Milk** 

Quality

(UC2.4)

(food processing,

quality systems)

- Between MVP1 and MVP2
- Implemented on first farms

WAGENINGEN JNIVERSITY & RESEARCH

In open call 3 use cases added

UC2.5: Lameness Detection through Machine Learning (Ireland, Waterford Institute of Technology

UC2.6: Precision Mineral Supplementation (Denmark, Organe Institute ApS )

UC2.3 FMIS

Smartphone

App

UC2.5

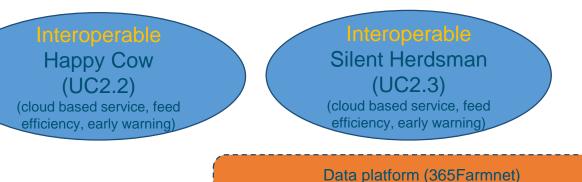
Dashboard

Web

App

UC2.1

UC2.7: Moonsyst Smart Monitoring system for dairy and beef cattle (Hungary, Moonsyst)



(app, real time sensor data cow centric, chain oriented)

UC2.2

Feeder wagon

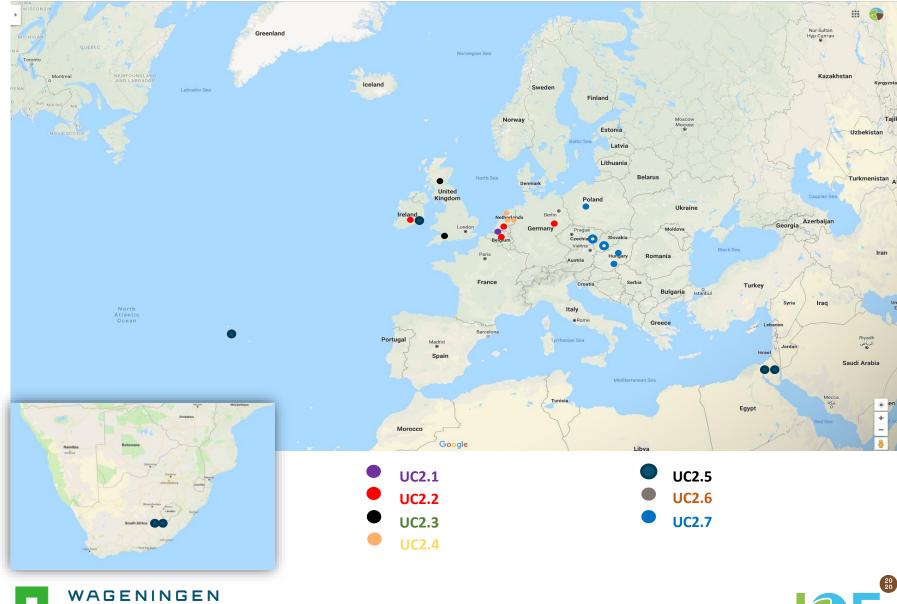
**Milking** robot

Milk processo

Milk truck

Selection gates

## Deployment



UNIVERSITY & RESEARCH



## Key performance indicators:

### Economic

- Productivity increase
- Efficiency improvement
- Cost reduction
- Quality improvements
- Environmental
  - Lower input
  - Lower impact
- Social
  - Ease of work
  - Public health

Dimension	Categories	Indicators	UC
Economic	Productivity increase	Yield increase per cow (milk – meat - offspring)	2.2, 2.3, 2.5, 2.7
		Improved animal health	2.2, 2.3, 2.5, 2.5
		Reduction of calving interval	2.2, 2.5, 2.7
		Reduced production assets	
		Higher productivity / employee	
		Higher return on investment	
		Calibration sets provided & used for remote instrument monitoring	2.4
	Efficiency improvement	Increased production efficiency	2.4
	Cost reduction	Revenue increase	2.1, 2.3
		Reduced work time	2.2, 2.7
		Reduction of culling due to lameness issues	2.5
	Quality Improvements	Improved tractability	
		Improved precision of measurement values	2.4
		Accuracy if all cows are inside or outside the barn	2.1
Environmental	Lower input	Increased animal health & welfare	2.1, 2.2, 2.3, 2.
		Reduced assets production	
		Improved processing/resource use	2.4
		Less waste/not qualified products	2.4
	Lower impact	Lower emissions & Leaching	6.1
Social	Ease of work	Reduction of worktime	2.1, 2.2, 2.3, 2.
		Improved precision of values	2.3, 2.4
		Disseminate to dairy farmers directly	
	Public health	Increase quality food, food safety and security against terrorism	2.4

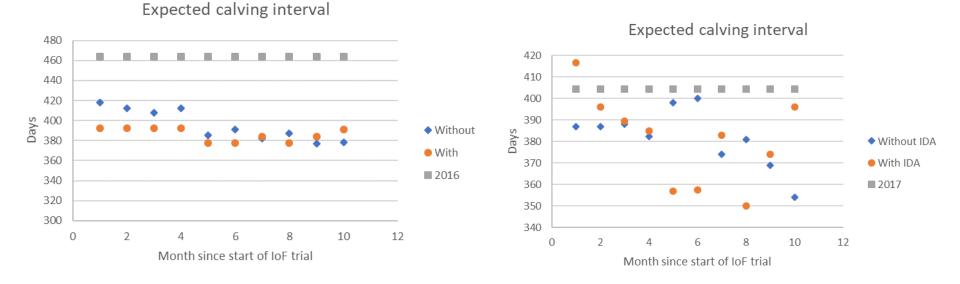




## **Use Case 2.2. Happy Cow Impact**

### FARM 1: Netherlands

### FARM 2: Belgium



# Estrus has shown improvement in Farm 1, while results are inconclusive on Farm 2.





## **Discussion points**

- IoT implementation in products and services is:
  - 1. Easy
  - 2. Complicated
  - 3. (hardly) Impossible

Implementation of IoT-products and services in practice and show benefits is:

- 1. Easy
- 2. Complicated
- 3. (hardly) Impossible
- Building an IoT community to share knowledge and experiences is:
  - 1. Easy
  - 2. Complicated
  - 3. (hardly) Impossible

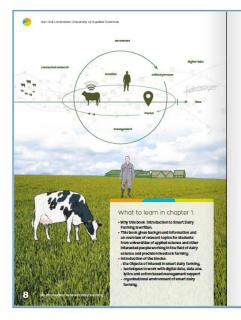




## Author of ...



# PDF kan gedownload worden: https://doi.org/10.31715/20181





#### van hall larenste n university of applied sciences

1. Introduction

The book will provide the reader with load for thought and give him hepitation for under-standing day burning and Information and Communication Richnology (ICT) statuat product justice development status than providing him with an detailed overview of the recent, developments, although this book, is mainly mean for students and start from universities of applied is not use and to be un-dervised in the students and start from universities of applied is not use and before and the starts.

versicies it also can be used by professionals

Versices it also can be used by protessional already working on applications in research and development for this field of expertise, or people already active as daily farmer of farmer advisor.

The SDF concept The SDF concept has been developing for almost two docades, healied by research and the development of products that have matched the market. Farmers have almady searcid working with these products, which

same working with these produces, which leads to widespread knowledge. How wer, the concept haart yes reached the new genera-tion of farmers. This is because training and aducation hashing yor locused on the SDF concept. In order to study why the concept haart boom included in education the author of this book, Kees Lekthors, started a profes

of this book, Kees Leikhens, stanad a profes-senthip in Herd Management and Smart Daily Farming at the Van Hall Laverssoln University for Applied Sciences in 2014. During his prote-senthip he set up a minitor on this topic. While doing this it became clear that information

comprehensive insight in the concept of SDF.

The objective of this book 'An introduction to Smart Dairy Farming' is to provide insight in the development of the Smart Dairy Farming

(SDF) concept and advise as to how to apply this knowledge in the field of activities of students from universities of applied science.

The information in this book includes background information and

for students is fragmented. He experienced in several Dutch and European projects, except from the EU-PLF project, that there is hardly any decent education material available. The author finds that education is an important, factor in transition and innovation adoption processes. Not only the early adopters and nnovators (based on work of Rogers and the Diffusion of Innovations ) should benefit from

the SDF concept, but also the early and late

majority should benefit from it. He believes that education is a very good internal motiv tor for free change of behaviour of stud that wants to become farmers or other Involved stakeholders.

Although including examples from other sec tors such as poulty, pig and arable farming systems could make the theory even more tors such as poulty, pig and antise terming systems could make the theory even more challenging, this book specifically focuses on the dairy sector. Most of the examples origin from the Netherlands, but SDF can be

applied worldwide. Elaboration on management of individual criws and calves that are mont of individual cows and calves that are part of a group, and management of location and time specific grass production in the daity sector will be given. In order to fully comprehend this information, it is important

to understand the challenges that the dairy

sector faces and what the SDF concept conreferrers to tackin these chollenges



Dr. It Kaes Lokhorst 9

0 Introduction









## INTERNET OF FOOD & FARM

