



This project has received funding from the European Union's Horizon 2020 research and innovation programme (ISIB-2015-1 programme) under grant agreement Nº 696367

WP4 'Tailored Standard Operating Procedures'

Kees Lokhorst & Gelein Biewenga



End review 8-5-2019



Work done and results

Objective

 Develop(/test/implement) a series of Standard Operating Procedures (SOP's) which can be tailored to the specific needs of individual farms when adopting sensor and/or data analysis technology in dairy farming.

Results

- D4.1 Standard Operating Procedures: Report on internal validated sensor based SOPs, (2017) Lokhorst, Wind, Biewenga
- Additional report 'WP4 Tailored Standard Operating Procedures Report on improved external validated sensor based SOPs' (2018) Wind, Biewenga and Lokhorst
- D4.2 'SOP External testing and integration in a management decision support tool' (2018)
 Wind, Biewenga, Roemen, Hansson, Lloyd and Lokhorst
- Several events and workshops
- Prototype web application, VHL







SOP -> ACTION, WORK INSTRUCTION

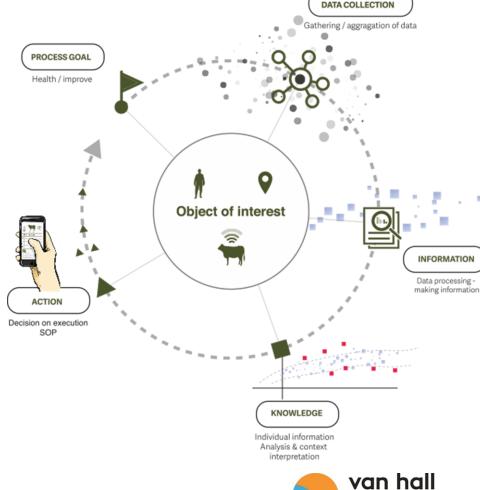
- SOP is a protocol describing what to do when and how (ACTION)
- based on management decisons and integrated sensor data



Decision on
ACTION
translated in
WORK
INSTRUCTION

OBJECT OF
INTEREST
WHO
WHAT
WHEN
WHERE
HOW





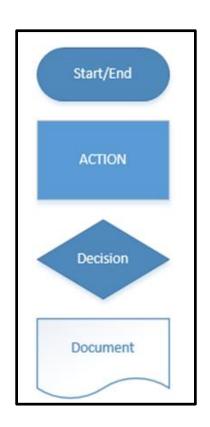
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Adopted method

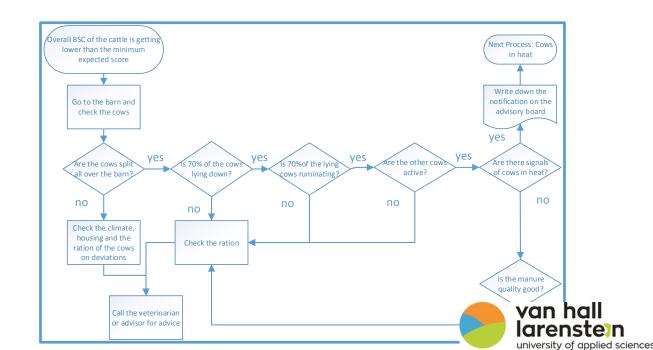




Standard Operating Procedures: A Writing Guide

Standard operating procedures used in combination with planned training and regular performance feedback lead to an effective and motivated workforce.

- 1. Plan for results
- 2. First Draft
- 3. Internal Review
- 4. External review
- 5. Testing
- 6. Post
- 7. Train

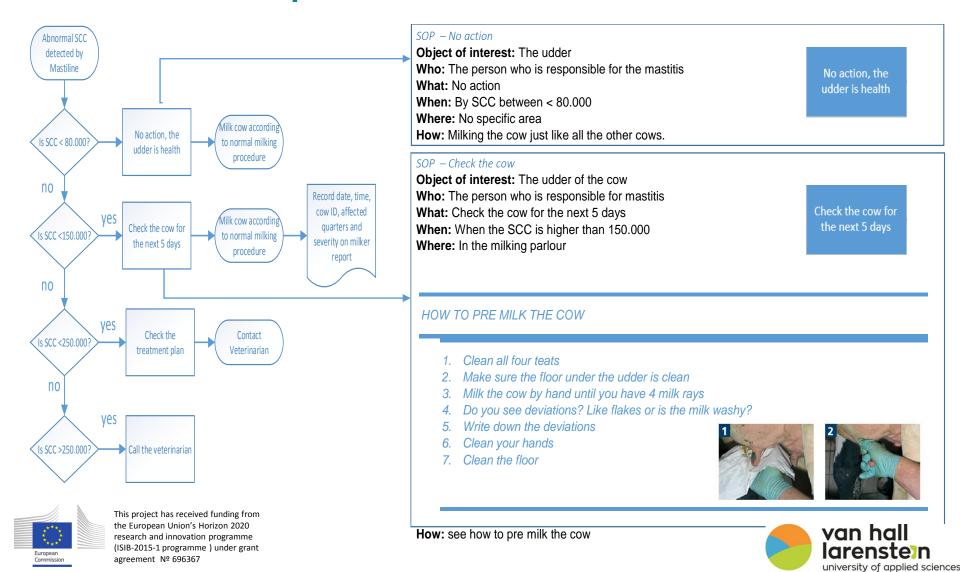




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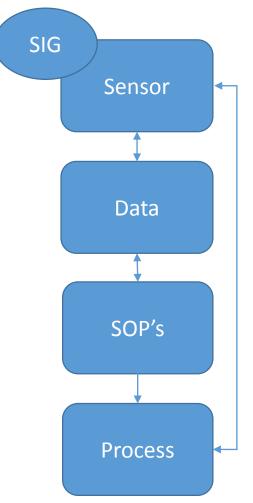


Mastiline – SCC - process detection mastitis





Results D4.1



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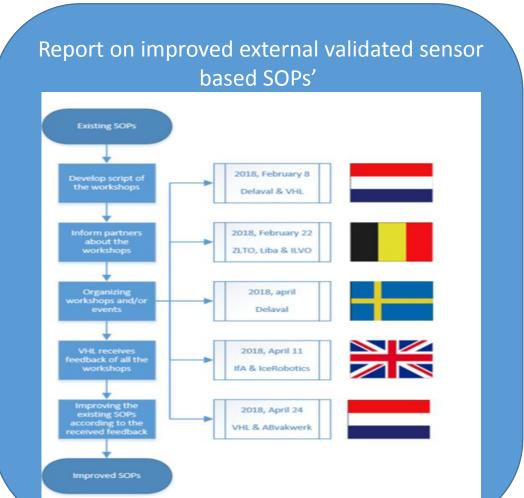
| 3. | Internal validated sensor based SOPs |
|----|--|
| | 3.1 Udder Health |
| | Mastiline – SCC - process detection mastitis |
| | Delaval Herd Navigator - LDH – process detection mastitis |
| | Delaval Herd Navigator - Conductivity - process detection mastitis |
| | Lely Milk Quality Control - SCC - process detection mastitis |
| | 3.2. Reproduction |
| | Delaval Herd Navigator – Progesterone – process detection heat |
| | Nedap Smarttag Neck – Activity – Process detection heat |
| | Delaval Body Condition Score Camera - Body Condition Score - process after detection heat. |
| | 3.3 Milking Data |
| | Delaval Herd Navigator - LDH – Process detection mastitis |
| | Delaval Herd Navigator - Conductivity - Process detection mastitis |
| | Delaval Herd Navigator – Progesterone – process detection heat |
| | Delaval Herd Navigator - BHB – Process detection ketosis |
| | Lely Milk Quality Control - SCC - process detection mastitis |
| | 3.4 Metabolic Diseases |
| | Cowmanager SensOor – Temperature - Process detection ketosis |
| | Delaval Herd Navigator – BHB – Process detection ketosis |
| | Nedap Smarttag Neck with Cow Positioning – Activity – Process detection diseases |
| | Cowmanager Sensoor – Temperature – Process detection diseases |
| | 3.5 Calves and Youngstock |
| | Moocall – Activity – Process detection giving birth |
| | Refractometer – Antibodies – process detection quality of colostrum |
| | 3.6 Grassland Management |
| | Nedap Smarttag Neck with cow positioning – activity – Process det |

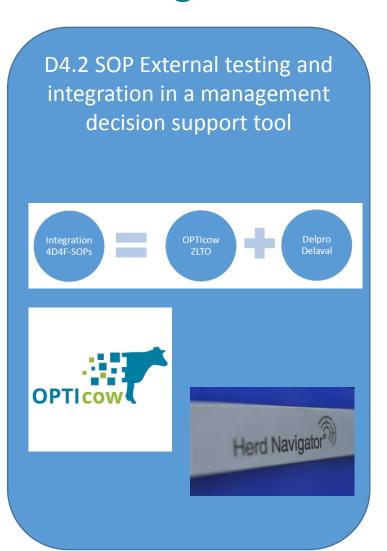
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Grass altimeter - height - process detection grass growth......



Process to improve SOP's and MIS integration







Review of the workshops

| Description | February, 08 | February, 22 | April | April, 11 | April, 24 | |
|-----------------------------------|--------------|--------------|--------|-----------|-----------|--|
| Workshop requirements: | | | | | | |
| 2 specific SOPs per workshop | √ (2) | ± | ٧ | ± | √ (3) | |
| 6-10 attendees | √ (7) | Event (34) | √ (6) | √ (6) | ± (5) | |
| Location in described country | √ (NL) | √ (BE) | √ (SW) | √ (UK) | √ (NL) | |
| SOP experts attending | √ (3) | √ (3) | √ (2) | √ (1) | √ (2) | |
| Received clear answers to: | | | | | | |
| Is the method of current SOPs | ٧ | ± | ± | ± | ٧ | |
| correct? | | | | | | |
| What are the weaknesses and the | V | ± | ± | - | ٧ | |
| strengths of the current SOPs? | | | | | | |
| Which modifications of the | ٧ | ± | ± | - | ٧ | |
| current SOPs are necessary to | | | | | | |
| make them practically feasible? | | | | | | |
| How would the SOP look like if | ٧ | - | ± | ٧ | ٧ | |
| you would design these SOPs? | | | | | | |
| Create an improved version of the | ٧ | - | ± | ± | ٧ | |
| SOPs | | | | | | |





Example of metadata SOP improvements

| Standard Operating Procedure | Special Interest Group | Changes made | Workshop | Country | Attending Farmers (F) or SOP-Experts (E) or Other (O) | |
|--|---------------------------|-----------------|----------|---------|---|------|
| Delaval Herd Navigator – LDH – detection mastitis | Milking Data | Х | 1,3 | NL, SW | FE | T, D |
| Delaval Herd Navigator – Conductivity – detection mastitis | | | | | | |
| Delaval Herd Navigator – Progesterone – detection heat | | х | 1,3 | NL, SW | FE | T, D |
| Delaval Herd Navigator – BHB – detection ketosis | | | | | | |
| Lely Milk Quality Control – SCC – detection mastitis | | х | 5 | NL | E | D |
| Cowmanager SensOor – Temperature – detection ketosis | Metabolic | х | - | NL | 0 | D |
| Delaval Herd Navigator – BHB – detection ketosis | | | | | | |
| Nedap Smarttag Neck (pos.) – Activity – detection diseases | Diseases | х | - | NL | 0 | D |
| Cowmanager SensOor – Temperature – detection diseases | | х | - | NL | 0 | D |
| Moocall - Activity - detection giving birth | | Х | - | NL | 0 | D |
| Refractometer - Antibodies - quality of milk | Calves and Youngstock | Х | 5 | NL | E | D |
| | Languloun | | | | | |
| Nedap Smarttag Neck (pos.) – Activity – detection location | | | | | | |
| Grass Altimeter – Height – detection grass growth This project has received funding from | Grassland Management | Х | - | NL | 0 | D |





Planned work

- Task 4a Develop 10 draft Standard Operating Procedures (SOPs) → D4.1
- Task 4b Test the Standard Operating Procedures → internal and external review → D4.2 and additional work
- Task 4c Integrate SOPs into a management decision tool →
 Opticow & Delpro in D4.2
- Task 4d Publish Standard Operational Procedures (SOPs) → 4D4F website
- Task 4e Link to EIP Operational Groups → 4D4F website and Nefertiti project







Impact

- Proposed method 'how to write SOP's' (in a process, sensor and data context) impacts the way we advise farmers to integrate new sensing systems or data sources. They really have to think of how they are working now, and how they think to work when they buy/use new data/sensors.
- Extra possibility to integrate in a management system environment
- Train young professionals. This work method was introduced in the minor Smart Dairy farming at Van Hall Larenstein University of applied science.
- Inspired project partners (also goat SOP) and visitors of the workshops and Studium Generale at VHL



Standard operating procedures

low can we make Standard Operating Procedures (SOPs) more useable in dairy farming? Today's farms are optimy more and more in touch this automatic systems, such as for example millising notice, sorsor technology and more real-time applications that make work on a dairy arm more feasible. Standard operating procedures can help to make a decision on what to do when a certain alarm shows up when using enorso on cattle.

The main objective of work package 4 is to develop, test and implement a series of SOPs which can be tailored to the specific needs on advidual farms when adopting sensor and data analysis technology in dairy farming.

Report on SOPs. Nersion 2.0

SOP testing and integration in a management decision supp

PDF SOP 1. Fat in goat milk

SOP 3. Protein in goat milk

Veehouderij - Akker- & Tuinbouw



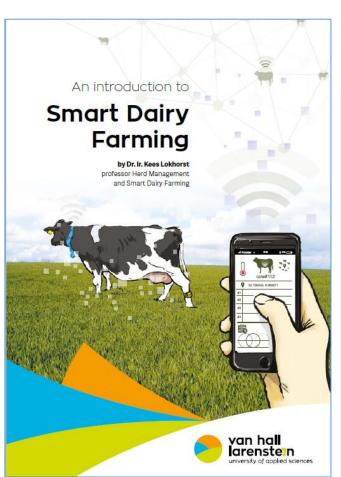
Protocol op melkveebedrijf zet data om in actie



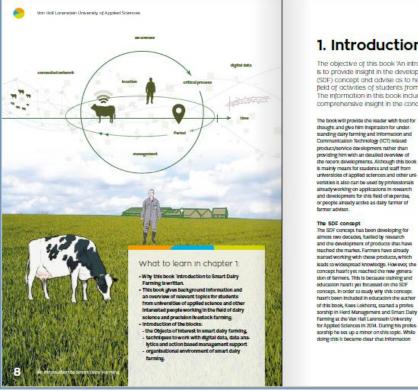
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Chapter 7 is dedicated to writing SOP's



PDF can be downloaded: https://doi.org/10.31715/20181



1. Introduction

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 comprehensive insight in the concept of SDF.

thought and give him inspiration for understanding dairy farming and information and Communication Technology (ICT) related producty/service development rather than providing him with an detailed overview of the recent developments. Although this book is mainly meant for students and staff from universities of applied sciences and other universities it also can be used by professionals already working on applications in research. and development for this field of expertise or people already active as daily farmer of

The SDF concept has been developing for almost two decades, fluelled by research and the development of products that have reached the market, Farmers have already started working with these products, which leads to widespread knowledge. However the concept hasn't yet reached the new generation of farmers. This is because training and education hasrft yet focussed on the SDF concept. In order to study why this concept hasn't been included in prioration the author of this book. Kees Lokhorst, started a professorship in Herd Management and Smart Dairy Farming at the Van Hall Laronstein University for Applied Sciences in 2014. During his profes sorship he set up a minor on this topic. While

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 Innovators (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 motivator for free change of behaviour of students that warns to become farmers or other involved stakeholders.

Although including examples from other sec tors such as poultry, pig and arable farming systems could make the theory even more challenging, this book specifically focusses on the dairy sector. Most of the examples origin from the Netherlands, but SDF can be applied worldwide. Elaboration on management of Individual cows and calves that are part of a group, and management of location and time specific grass production in the daily sector will be given. In order to fully comprehend this information, it is important to understand the challenges that the daily sector faces and what the SDF concept contributes to tackle these challenges.

Dr. Ir Kissa Leidsonst











Bonus

Webapplictation 4D4F-SOP









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END



