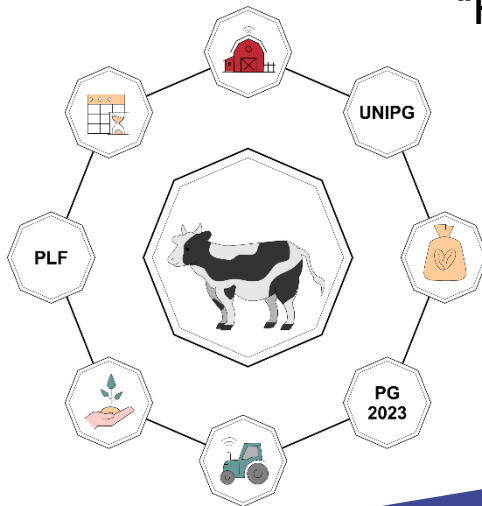


Reproductive Efficiency

Decision making based on relevant data and reproductive indexes

ERASMUS + BLENDED INTENSIVE PROGRAMME

“Precision Livestock Farming (PLF)” – 6/7/2023



utad UNIVERSIDADE
DE TRÁS-OS-MONTES
E ALTO DOURO

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Outline

Part 1 – The relevance of reproductive management on farm production economic results

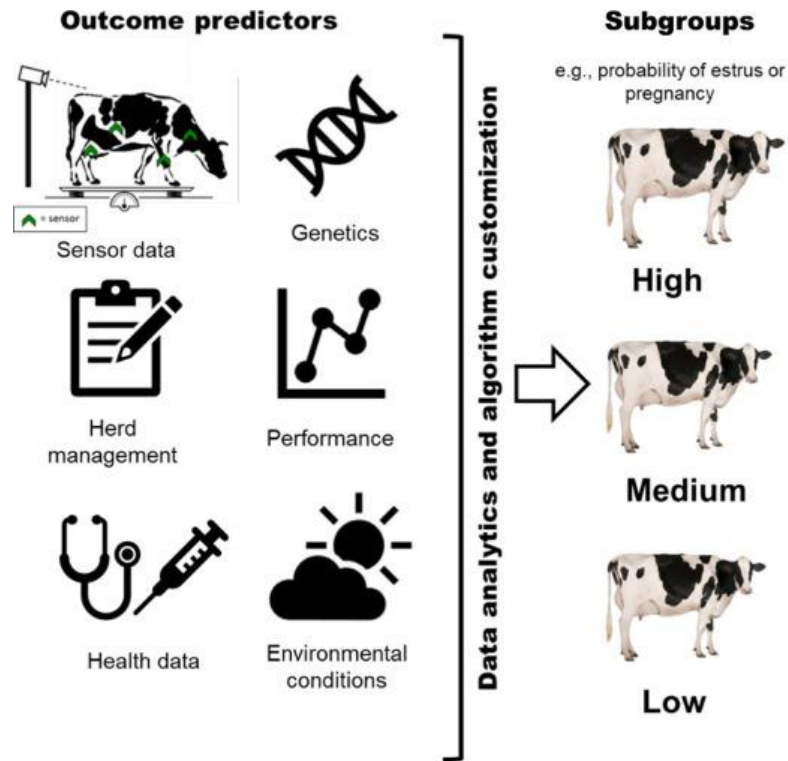
Part 2 – Reproductive data collection

- a) Goals
- b) Criteria
- c) Type of data
- d) Critical points

Part 3 – Hands-on

- a) Data classification
- b) Data processing
- c) Reproductive indexes
- d) Swot analysis

Concluding Remarks



<https://doi.org/10.3168/jds.2021-21476>

Learning Outcomes

- ☺ **Recognize** the relevance of records for assessment of farm efficiency;
- ☺ **Identify** the core records for the evaluation of reproductive performance;
- ☺ **Select** the reproductive parameters to be included in the monthly/annual analysis of the farm's reproductive performance;
- ☺ **Calculate** parameters and indexes of reproductive performance according to the production system/specie;
- ☺ Results **analysis** on a SWOT base;
- ☺ **Identify** potential critical points;
- ☺ **Propose** one or more alternatives that can overcome the main identified failures;



<https://doi.org/10.1016/j.sbsr.2021.100408>

Ice-Breaker Activity



Time limit: 15 minutes

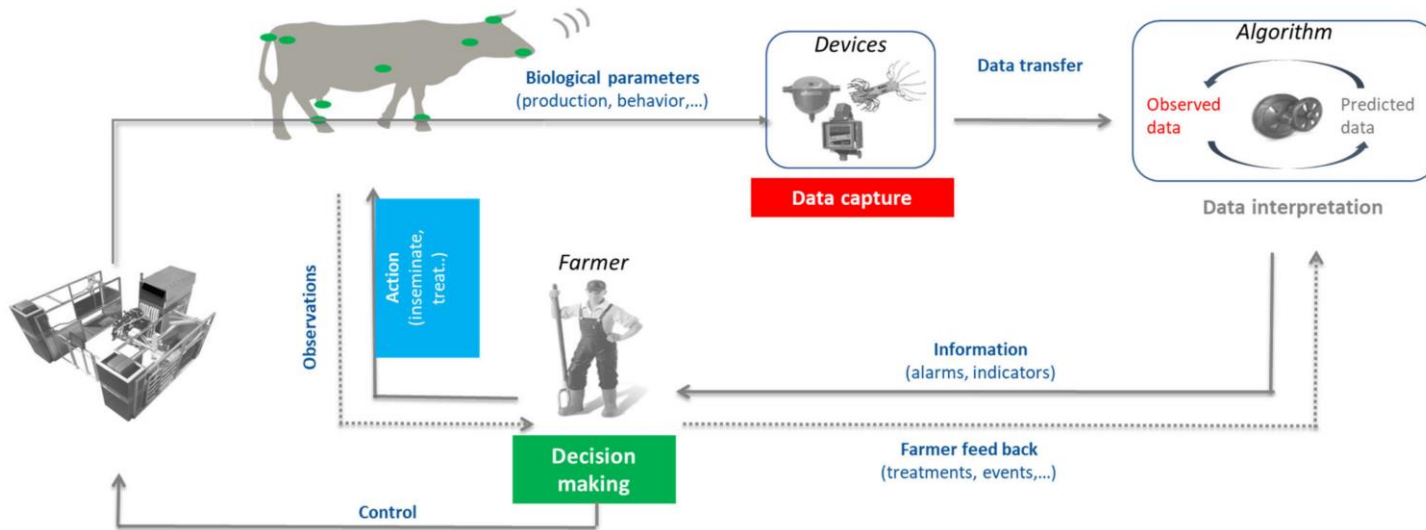
Think of a phrase, slogan, adjective, book/film title that defines you in some way

Activity 1

slido



Precision Livestock Farming



Time limit: 10 + 15 minutes

The importance/impact of reproductive management on farm results'

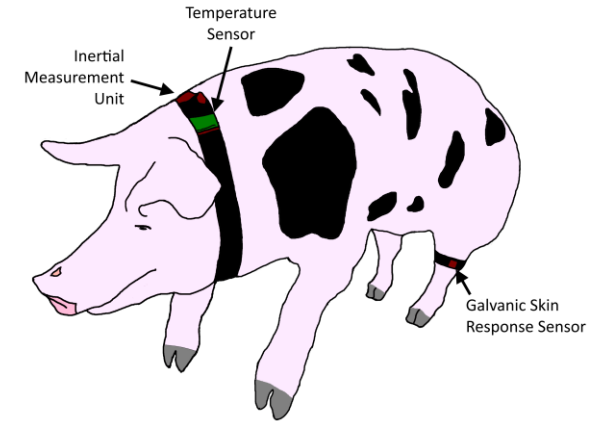
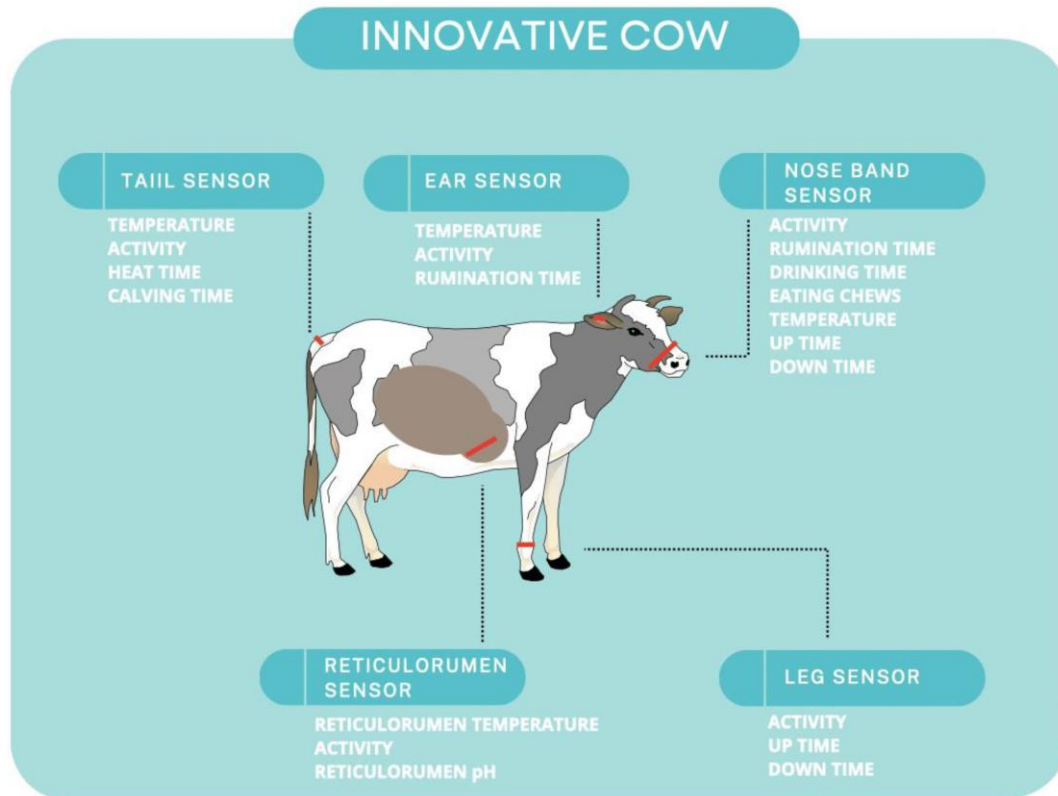
① Start presenting to display the poll results on this slide.



Think, reflect, decide

Activity 2

Data-driven decision-making leads to better, more efficient, and timely decisions that will **advance** the productivity of **livestock** herds.



S. SAMARAS

https://www.mdpi.com/journal/animals/special_issues/technology_reproductive

Animals 2023, 13(5), 780; <https://doi.org/10.3390/ani13050780>

Activity 2

Reproductive data collection

- a) Goals
- b) Animals' reproductive selection criteria
- c) Type of data
- d) Critical points/obstacles

Scenario

Think about a particular animal production system (dairy cattle, beef cattle, pork, sheep,...) and mention, following the points, what would be most appropriate to answer each one of them;

Methodology

Cooperative work in the Think-Pair-Share strategy

Time limit: 60 + 60 minutes

Activity 2

Reproductive data collection

- a) Goals
- b) Animals' reproductive selection criteria
- c) Type of data
- d) Critical points/obstacles

Let's talk about it and consolidate ideas



Activity 2

Let's talk about it and consolidate ideas

- ✓ efficient breeding record system
- ✓ records according to production objectives
- ✓ interpretation and evaluation of the information conveyed by the records

What is the economic impact of reproductive efficiency?

- a) increased productivity
- b) decrease in production costs

Actions to maximize reproductive efficiency

- a) Set goals
- b) Suitable design, implementation and carrying out the action plan
- c) Have a monitoring system

Activity 2

Let's talk about it and consolidate ideas

Data features

- a) Individual or collective: animal, farm, region, country, ...
- b) Manual or automatic
- c) Complete
- d) Accurate
- e) Updated
- f) Allow to summarize information and of simple interpretation

Activity 2

Let's talk about it and consolidate ideas

Information obtained from the records

- a) LONG-TERM: semen selection and genetic improvement (pairings), culling decision (replacement), follow-up of long-term goals (calving interval...)
- b) MEDIUM/SHORT TERM: heat interval vs efficiency in heat detection, signaling of repeated breeders, evaluate the accuracy of the PD, evaluate management efficiency (nutrition, facilities, health, ...)

Activity 2

Let's talk about it and consolidate ideas

Data should focus on relevant reproductive events:

- a) Age at 1st AI/calving, estrus time, AI dates and semen used, pregnancy diagnosis, calving date, pregnancy losses, dystocia, treatments, ...
- b) Milk production, number of foal born, alive x days and weaned, weight of yearlings at
- c) Feeding level and quality, BCS and/or animal weight
- d) Reproductive seasonality
- e) Overall, they should allow to determine the reproductive efficiency of the production system

Activity 2

Let's talk about it and consolidate ideas

Data examples

Birth date: predict the month (season) of the first AI, predict time of first calving

Heat date: predict the date of the next heat, heat interval, ...

AI date: predict date of the next heat, predict date of pregnancy diagnosis, predict drying date, predict calving date, quantify the interval between heats

Calving date: predict puerperal evaluation, weaning date, date of next AI, pregnancy check, BCS, drying

Recording of other elements: genealogy, pathologies, BCS

Activity 2

Let's talk about it and consolidate ideas

Which parameters/indexes could be obtained?

Age at first calving

Time between calving and 1st AI: VEP, length between calving and the first heat PP, weaning age

Interval between calving and the next pregnancy: number AI/gestation, days between AI, repeat breeders

Fertility rate (at the 1st AI, at day X, global)

Prolificity rate

Heat detection rate

Culling rate

(...)

Activity 3

Hands-on

- a) Data classification
- b) Data processing (Excel)
- c) Reproductive indexes
- d) Swot analysis

Scenario

Using the provided database, determine the required reproductive parameters and carry out a global analysis using a SWOT perspective

Methodology

Cooperative and collaborative work

Time limit: 60 + 40 minutes

Activity 3

Hands-on

- a) Data classification
- b) Data processing (Excel)
- c) Reproductive indexes
- d) Swot analysis

Practical procedure

Based on the file with reproductive data of a dairy cattle farm, calculate the following reproductive indices and carry out the individual and general analysis of the farm's reproductive performance:

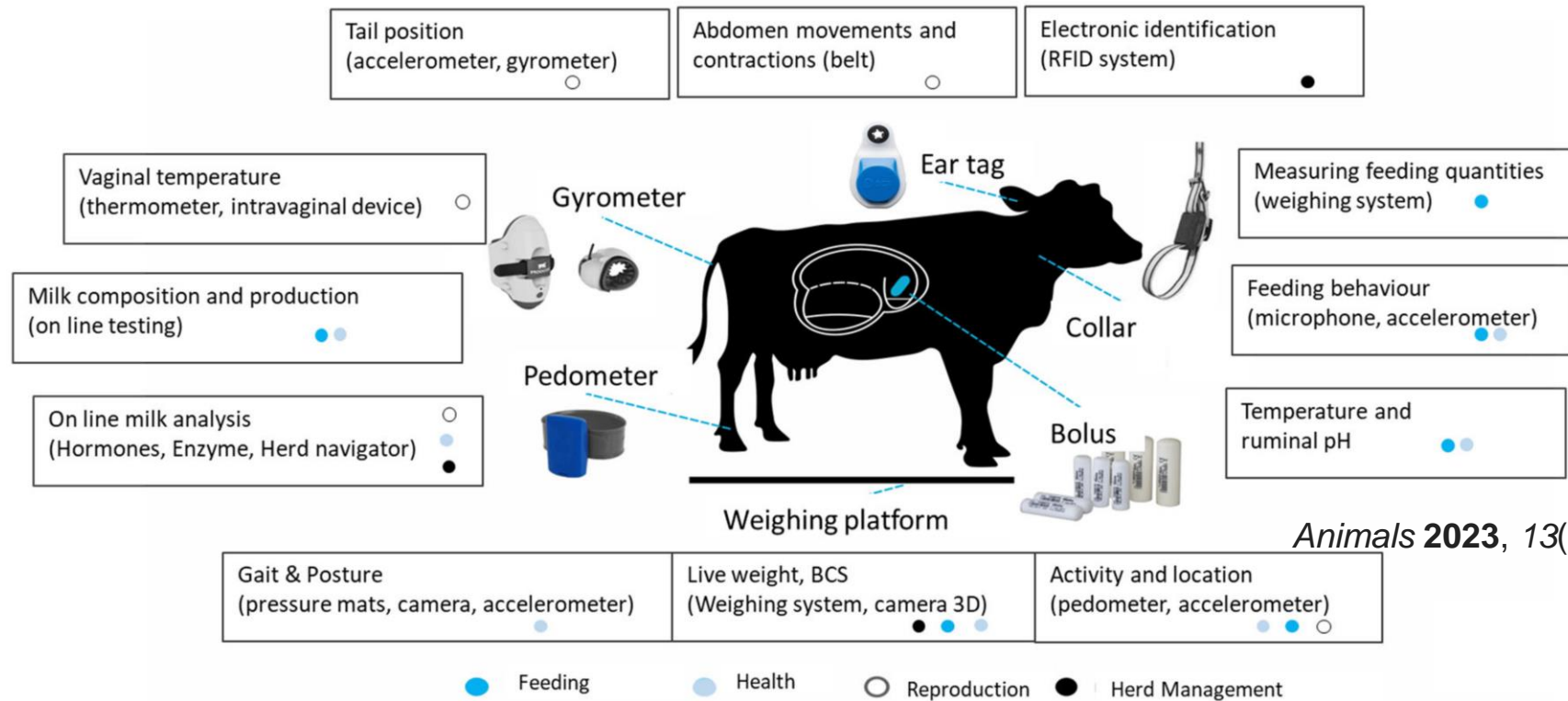
- a) Calving interval (months);
- b) Number AI per gestation;
- c) Days open;
- d) Average heat interval;
- e) Interval calving – 1st AI;
- f) Interval calving- AI fertilizing;
- g) % heat detection;
- h) Fertility rate;



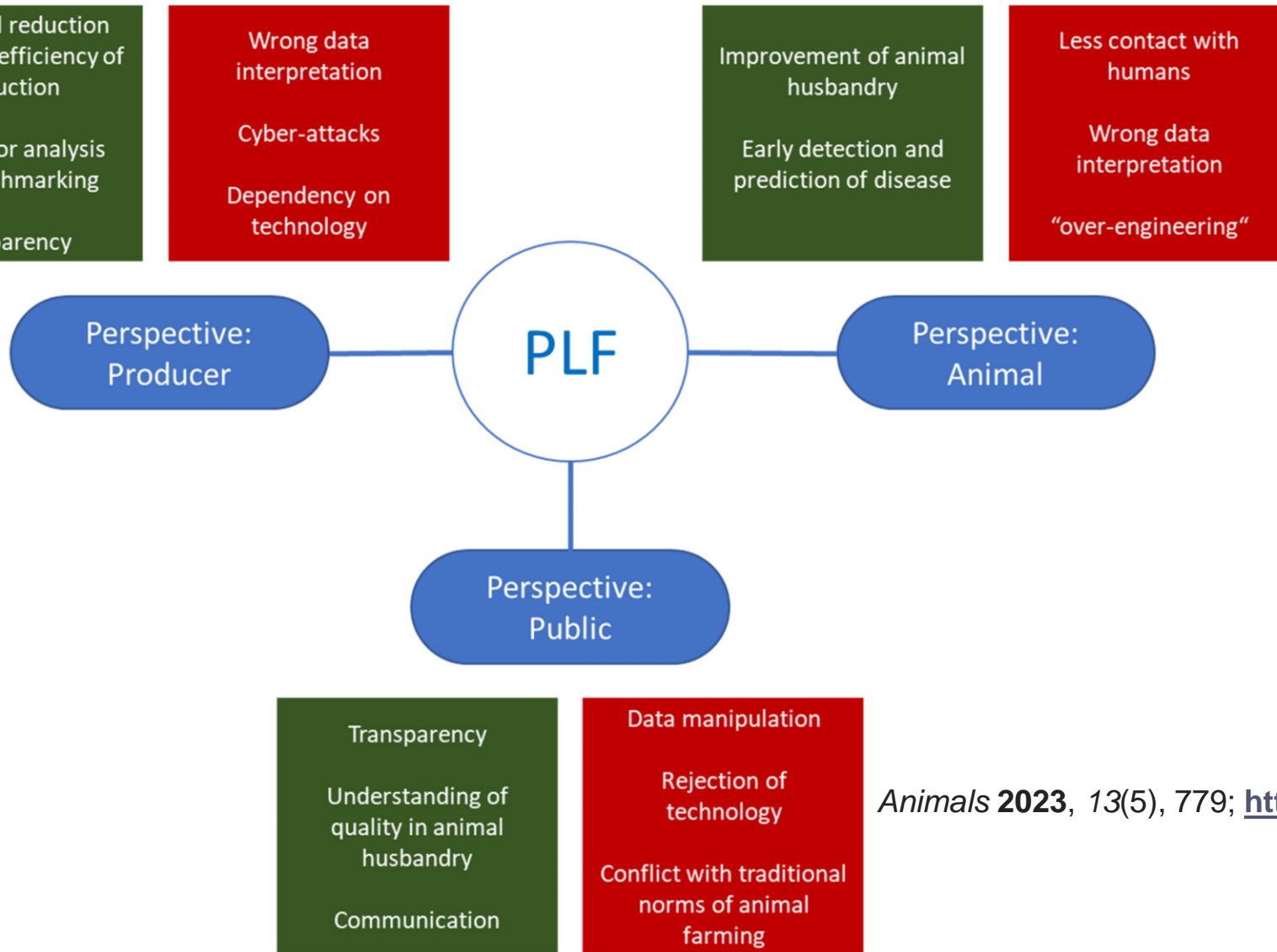
Think, reflect, decide

Concluding remarks and tips

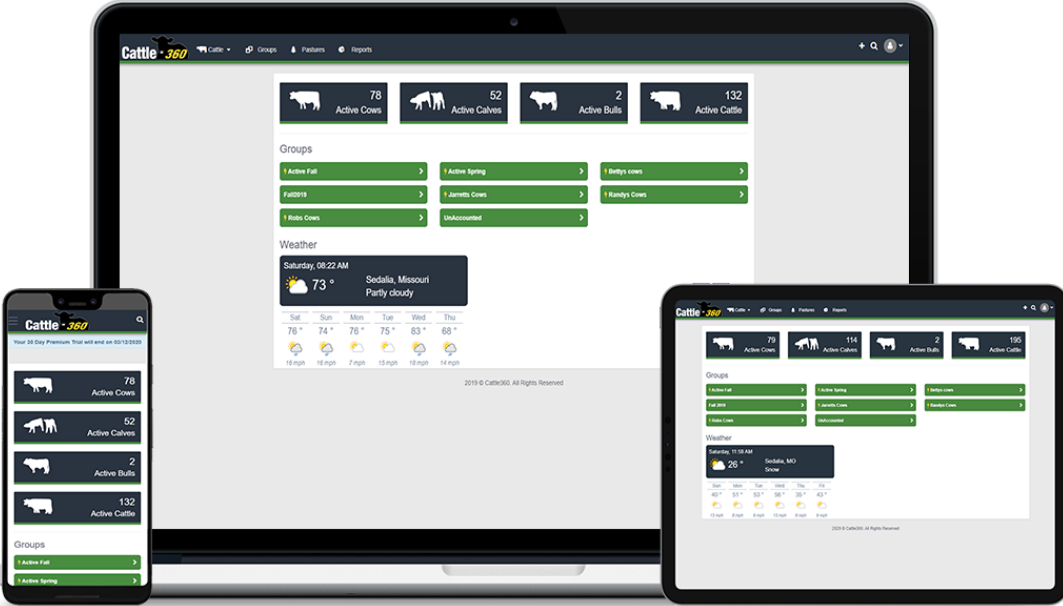
Overview of IoT (Internet of Things) related to dairy farming



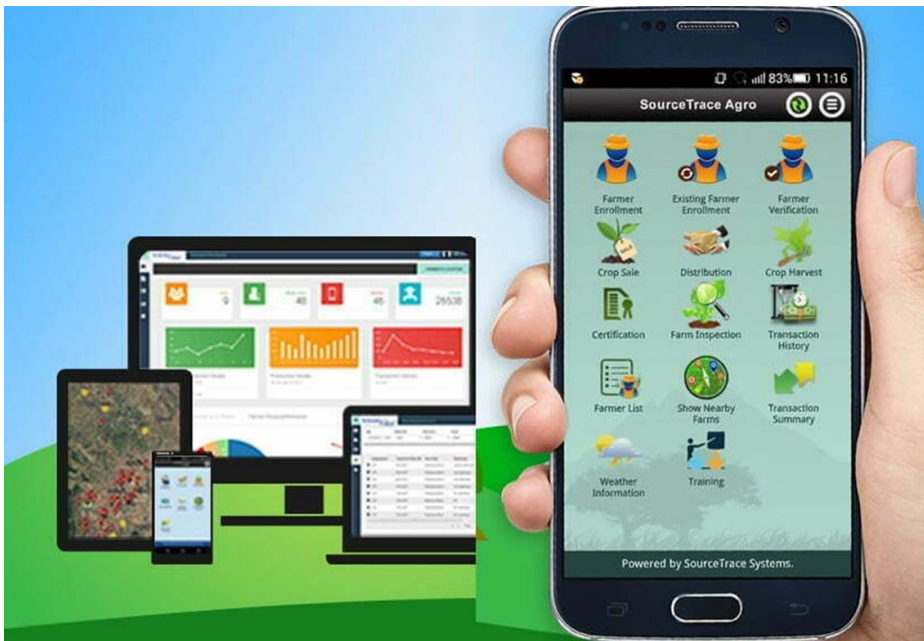
Animals 2023, 13(5), 779; <https://doi.org/10.3390/ani13050779>



Animals **2023**, 13(5), 779; <https://doi.org/10.3390/ani13050779>



<https://www.cattle360.com/>



<https://makeanaplike.com/free-cattle-record-keeping-apps-software/>

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Concluding remarks and tips

 There are no "magic recipes or solutions"

 Avoid generalizations

 Each situation is unique

 Be pragmatic and goal-oriented during data collection and analysis

 Instruct and raise awareness of the importance of collecting and processing data in informed decision-making

Some References

<https://doi.org/10.1016/j.sbsr.2021.100408>

<https://doi.org/10.3168/jds.2021-21476>

<https://www.plugandplaytechcenter.com/resources/livestock-farming-technology-animal-agriculture/>

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