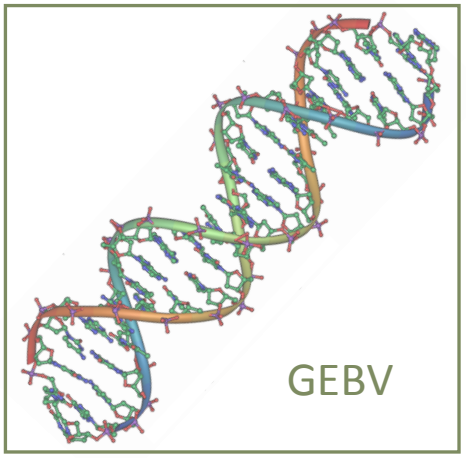
Poznań University of Life Sciences
FACULTY OF VETERINARY MEDICINE AND ANIMAL SCIENCES
Department of Genetics and Animal Breeding

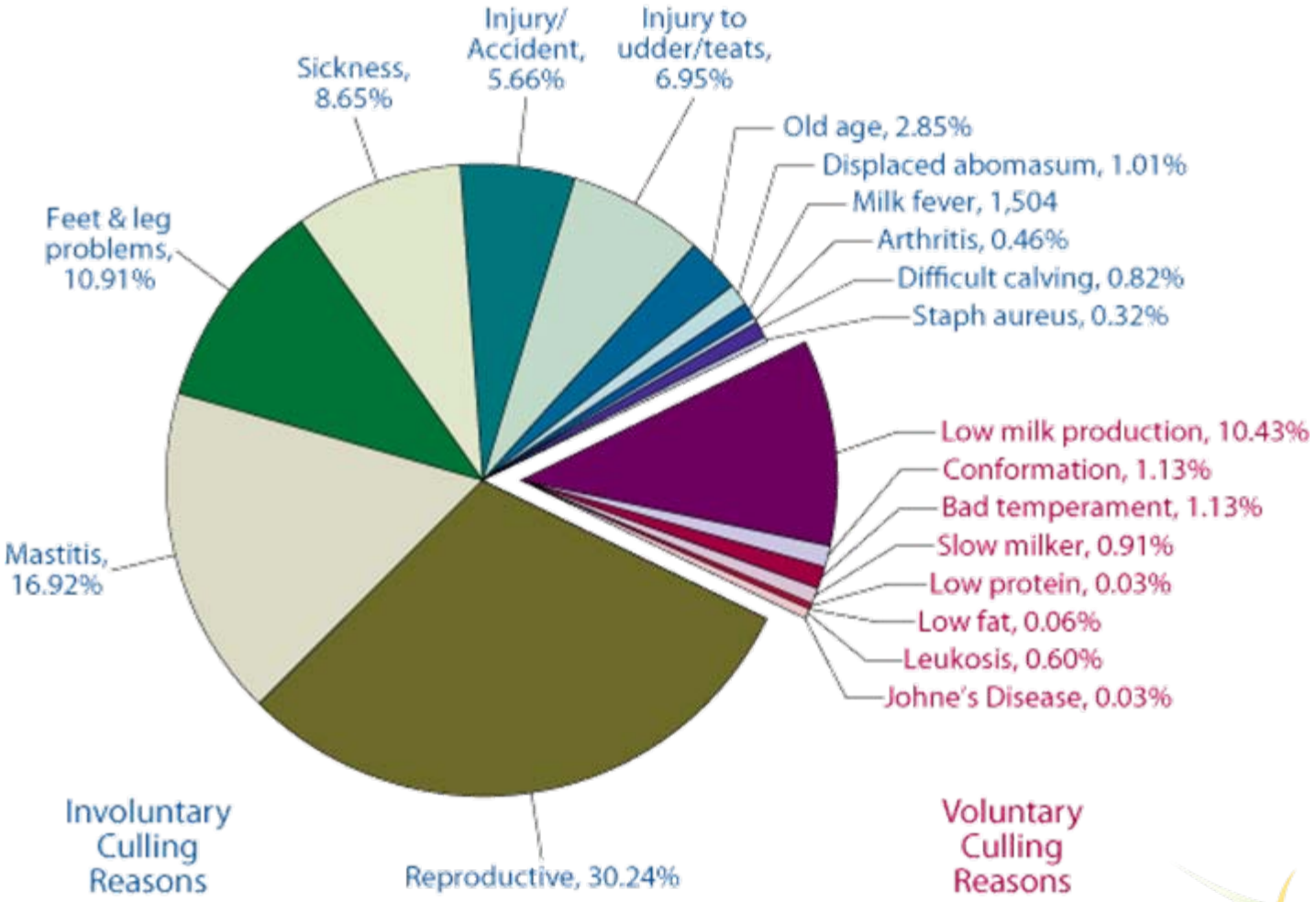
# On-farm recording of fertility and health data using mobile devices

***Tomasz Strabel, Tomasz Nowak, Katarzyna Rzewuska***

*Poznan University of Life Sciences, Department of Genetics and Animal Breeding*



# Cows do not live long life. Culling reasons




*CanWest DHI and Valacta, 2014*

Poznań University of Life Sciences

# Genomic selection – new opportunities

- Increased reliability of cows' breeding values
- Increased importance of functional traits in selection indexes
- Small, optimized reference population (Pszczoła et al. 2012)
- Improved management on farms
- Automated systems more common
- Collecting and transferring data becomes cheaper
- Doubled genetic progress with GS

Phenotype

# Data sources on farm

- milk recording,
- AI organizations,
- veterinarians,
- on-farm computers

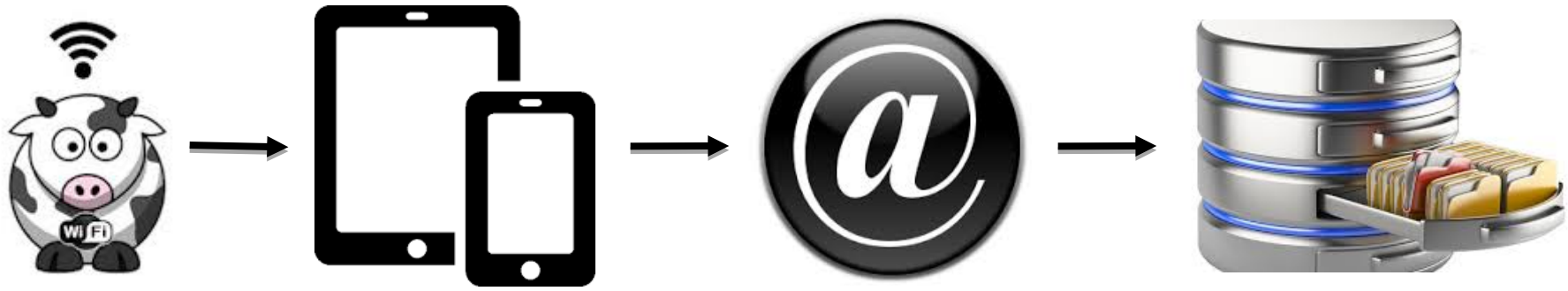
**Problems:**

- Lack of completeness
- Compatibility issues
- Ownership issues
- Delayed access

**Immediate use by the breeder of the data collected on farm is a guarantee of their quality and completeness.**

# The goal

- To develop an Internet based tool for online and offline collection of health and fertility data



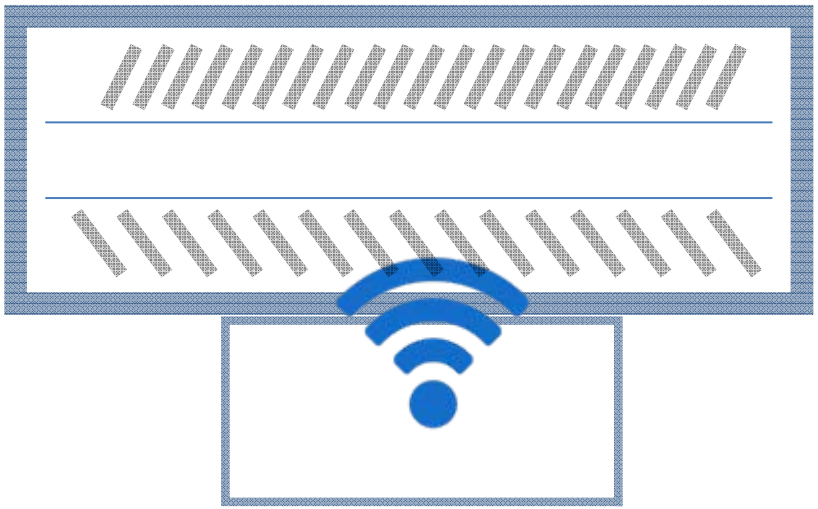
# Why Internet based tool?

- Immediate data transfer to centralized data base
- Lower software cost
- Compatibility
- No software updates necessary
- Can be run on any computer, tablet, smartphone

# Why offline? Limited coverage

## In a country


## In a barn



# Technology

- Runs on mobiles under **Android, iPhone, Windows Mobile**
- Runs on PCs under **Windows, Linux, MacOS**
- **Hardware independence** allows following technical progress and avoids vendor lock-in
- Capabilities of mobile devices and modern web browsers utilized to enable operation **without Internet connection or constant power supply**.
- Open source software is used for data processing and storage for **limitless scalability** and **code transparency**.
- The **central database** can be accessed through an HTTP API which provides possibilities for additional processing.

# Information collected

- basic **reproduction data**: calving dates, insemination,
- **novel fertility data**: heat observation, ovarian activity, results of pregnancy tests,
- **fertility disorders**: metritis, cystic ovaries,
- veterinary **treatments** and **hormone assays**,
- hoof trimming results and **claw disorders**,
- **culling reasons**.
- **Future:** connection to systems with production data

Claw with infection

Cow identification

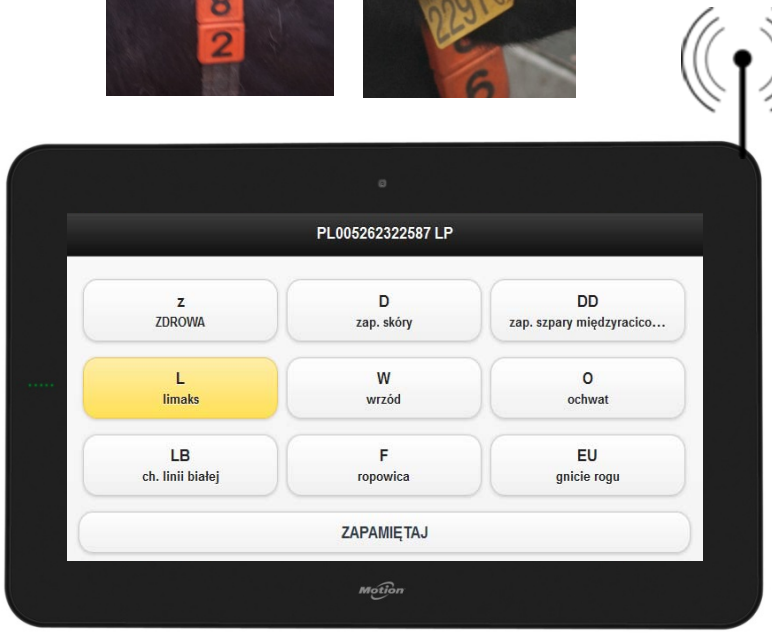
Problem coding

Data analysis - a report

1



2

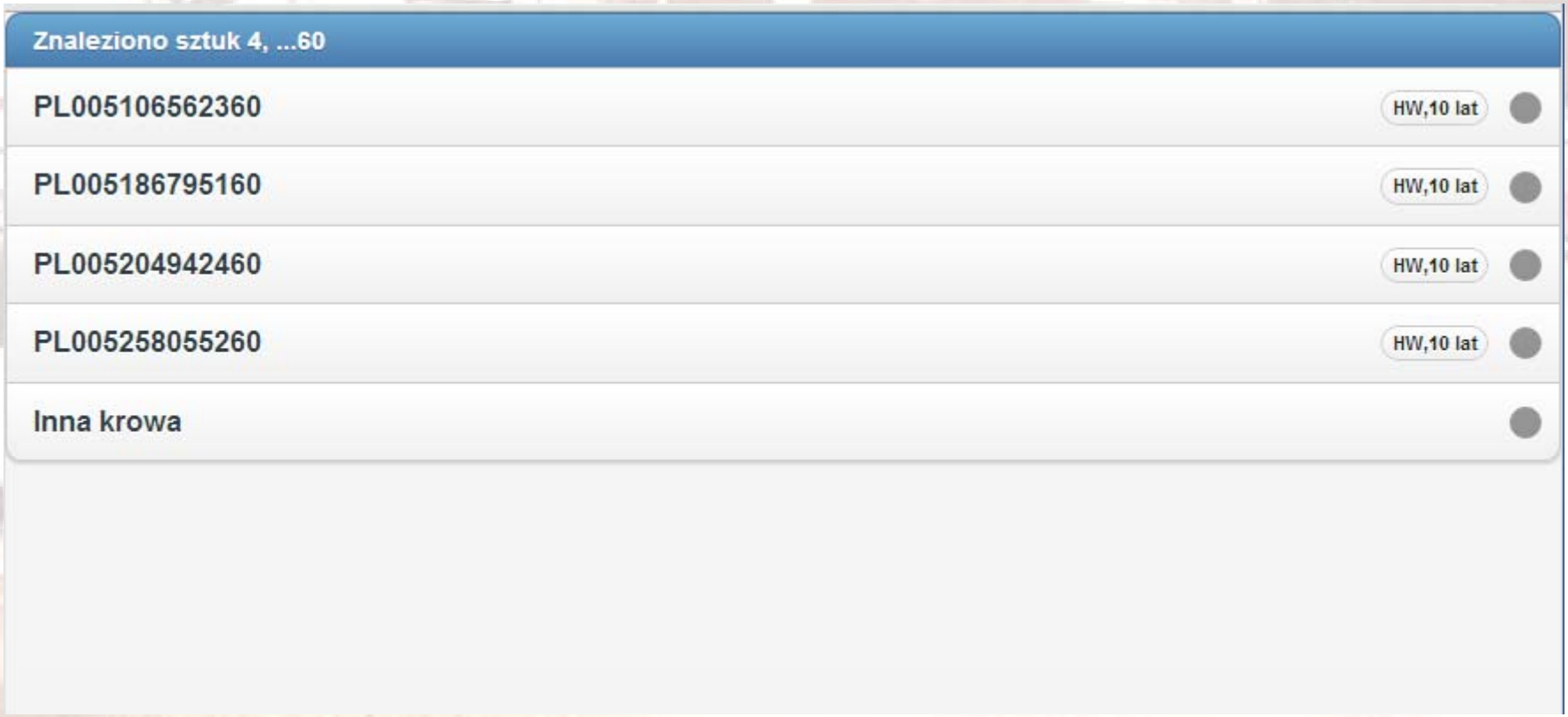



3

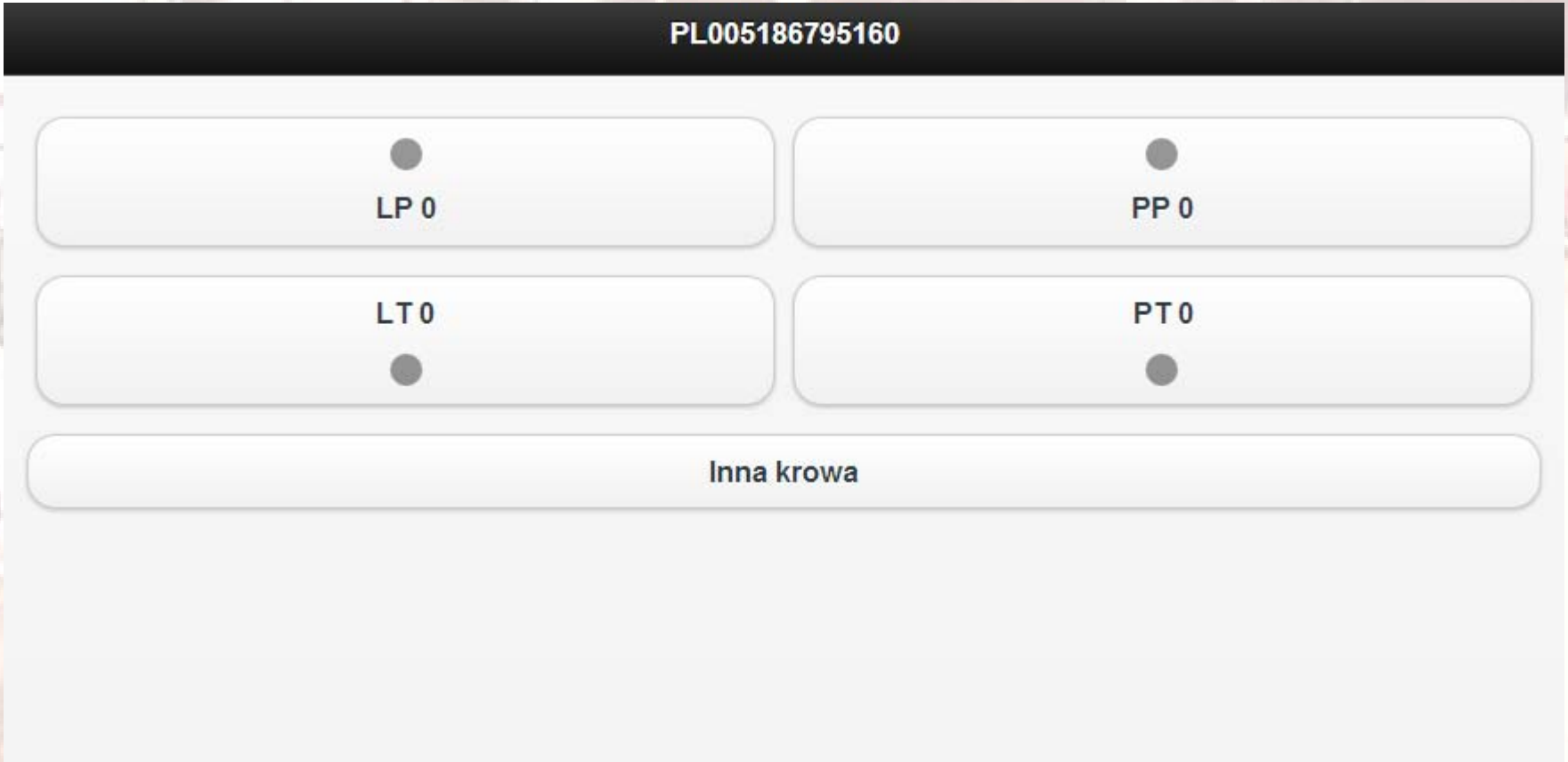
4

# Cow identification

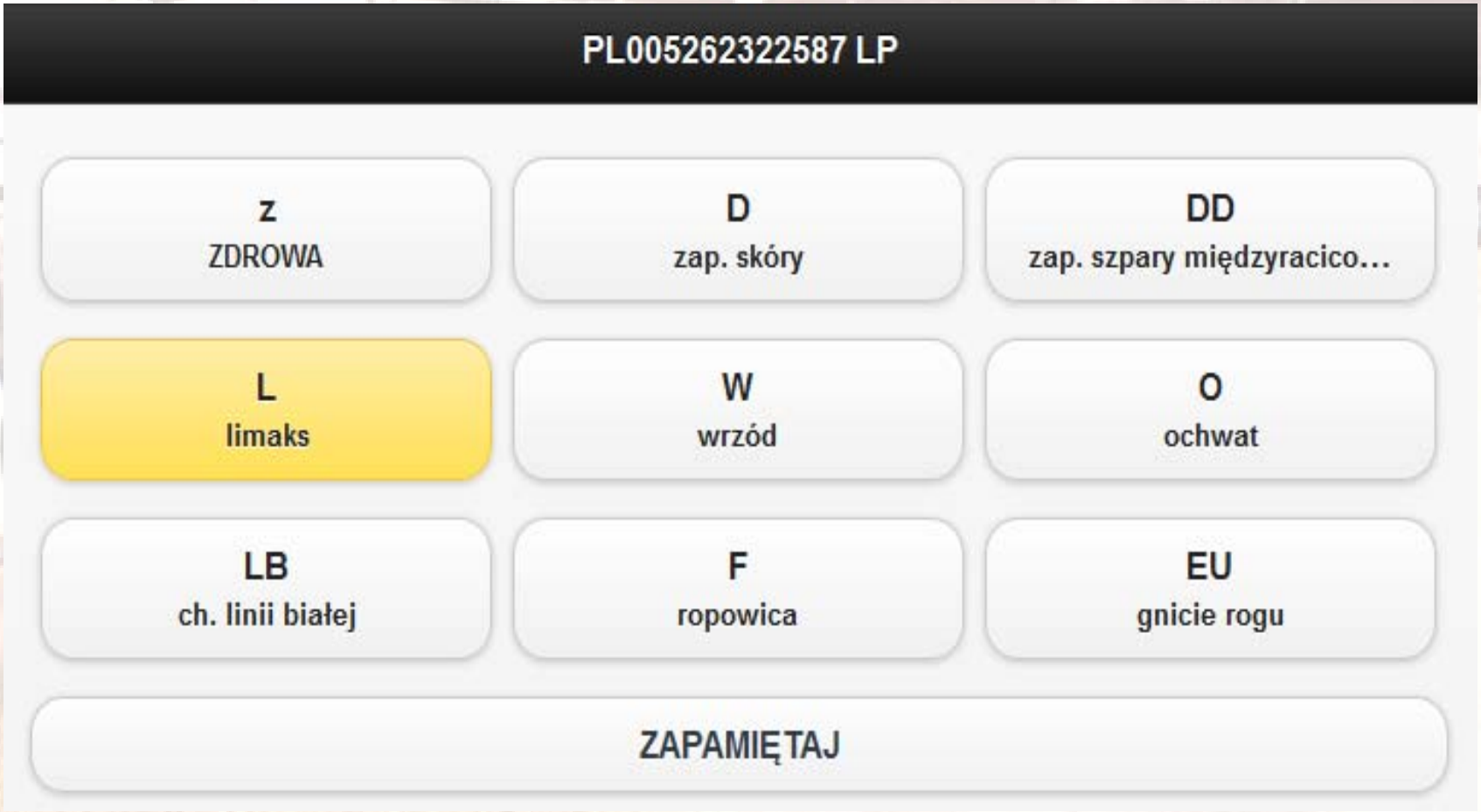
# Number confirmation



# Selection of the leg



# Problem coding



# Gynecological examination

- Performed on regular basis on large farms
- Application replaces traditional notes
- Reports
  - reduced veterinarian's time on paper work
  - analysis and reminders for herd management

# **Data** collected so far

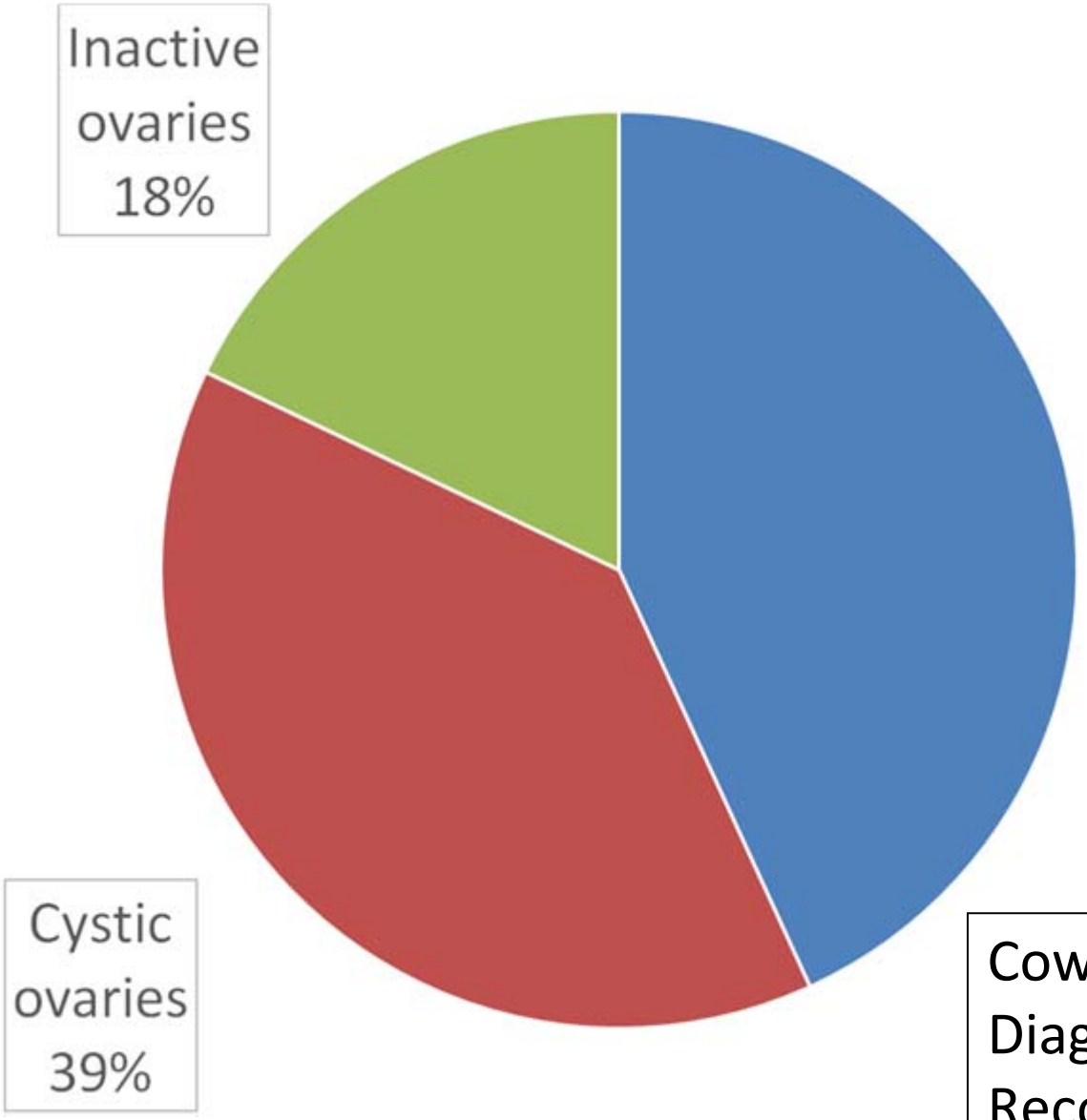
- A herd with 330 Polish Holstein-Friesian cows
- in a free-stall barn with automatic milking system

- **Pregnancy status and fertility** related health records were collected from 309 cows between November 2014 and April 2015
- Collection of data on **claw and leg disorders** was implemented earlier and performed for 13 months

# Fertility data collection

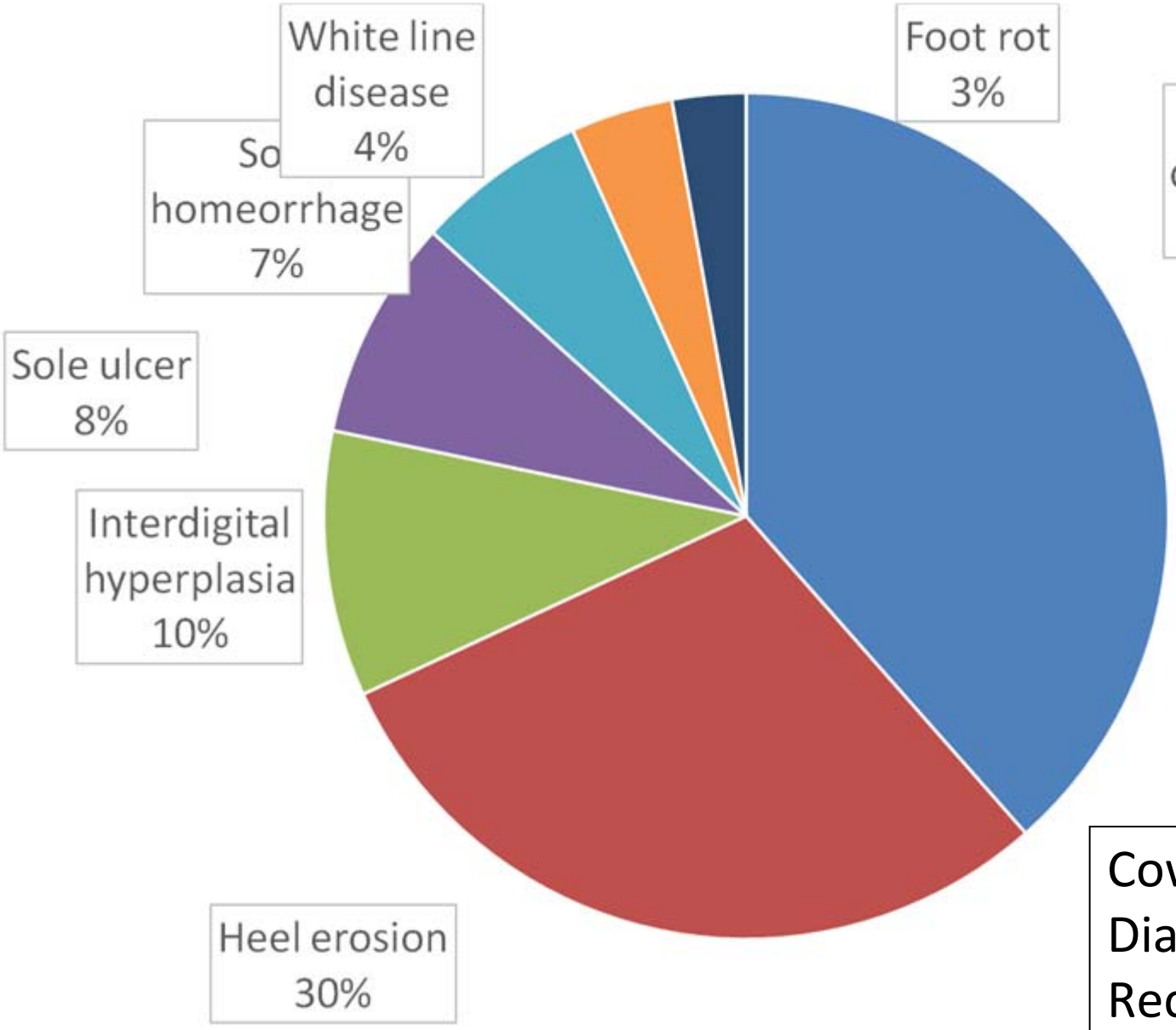
| | |
|---|---|
| 543 | • Ovarian activity and state of the uterus |
| 247 | • Pregnancy check |
| 211 | • Hormonal therapy |
| 181 | • Date of heat |
| 32 | • Estrus synchronization programs |

# Percentage of cases of fertility disorders




| | |
|---|---|
| Cows | 309 |
| Diagnosis | 757 |
| Records | 95 |

# Percentage of cases of claw disorders




| | |
|---|---|
| Cows | 571 |
| Diagnosis | 1214 |
| Records | 639 |

# Dataflow


Data recording

Decision making

**Data Management**

- Reproduction
- Health
- Nutrition

- Pedigrees
- Genotypes

**Genomic evaluations**

# Conclusions

- The new system implemented
- Complete data can be collected for immediate use
- Current status and trends easily monitored
- Further development - a comprehensive analysis
- Close cooperation with academia enables continues research
- More users - genomic evaluations should be feasible.

# Thank you for your attention

strabel@man.poznan.pl