



PASTINNOVA

Innovative models for sustainable future of Mediterranean pastoral systems

Regional Workshop - Living Lab

*Condividere esperienze su innovazioni comuni
Sharing experiences on common innovations*

Gagliano Aterno, Anversa degli Abruzzi, (AQ) 26-27 March 2025

Virtual fence What was done in Slovenia on Virtual Fence use during period of Pastinnova project

Neža Bric – Agricultural institut Bric, Soča



The PRIMA programme is supported under Horizon 2020, the European Union's Framework Programme for Research and Innovation



Different types of collars

Virtual fence collars

Smart collars

GPS collars

Identification collars

VIRTUAL FENCE

GPS for 24/7 animal location

IPX7 waterproof casing

Self-sufficient solar powered

Internal audio cue guiding livestock location

Integrated RFID tag

0422956032

eS1

Award winning livestock neckband for unprecedented

SMART COLLAR

Size
H (81.1mm) x
W (64.5mm) x
D (15mm)

Weight
900 grams

Operating Temperature
-30° to 50 °C

Waterproof (IP68)
and unique plastic composition create a strong, airtight casing

Communication
2.4GHz - 802.15.4

Area coverage
200 x 500m

Tag
7 years expected battery lifetime

GPS COLLAR

Operation temperature -30C - +50C

VHF frequency range 145 to 212 MHZ

Expected life 1 fix on 13hours, 7 years

Size 93 x 51 x 27

Data storage 65.000 locations

LOTEK

IDENTIFICATION COLLARS

ELECTRONIC IDENTIFICATION COLLARS

Virtual fence NoFence

The World's first Virtual fence.

NoFence is one and only manufacturer of Virtual fence systems in Europe who are selling collars now.

Collars are for cattle and for small ruminants.

150.000 of animals are equipped with NoFence collars nowadays.



Virtual fence Gallagher

Gallagher do not distribute their Virtual fence systems in Europe still.

Probably the most advanced Virtual fence system on world

Power independent

RFID (radio frequency identification) transponder

GPS for 24/7 animal location

IPX7 waterproof casing

Self-sufficient solar powered

Internal audio cue guiding livestock location

Integrated RFID tag

Award winning livestock neckband for unprecedented

How it works technically

First several beeps with higher and higher frequency and longest duration – 5 to 20 seconds.

After beeps electric pulse – no more than 3X.

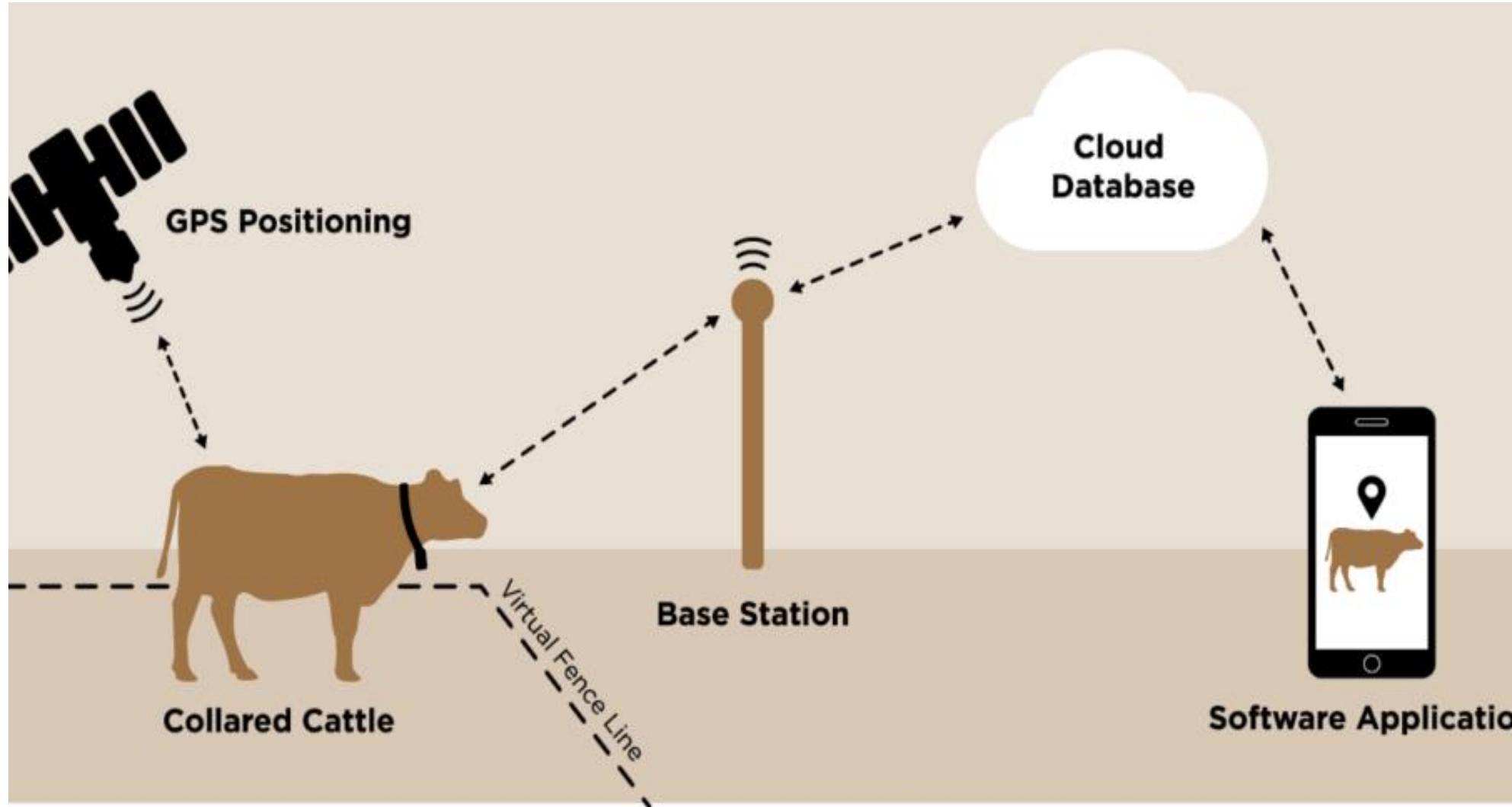


How it works schematically

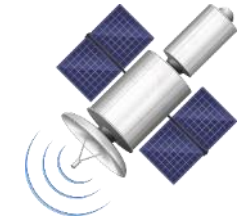
Five key components for whole cycle:

1. Collared cattle
2. Application on PDA
3. Satellites
4. Base station
5. Database cloud

Very important is positions of Base stations (strength of signal) especially at very ragged landscape



How it works in practice



Three key components for user:

GPS collar

Mobile phone with application

Knowledge of user!



afbi AGRI-FOOD
& BIOSCIENCES
INSTITUTE

Use of Virtual fence

On very intensive pastureland

On very extensive pasturelands



VSuper-G virtual fencing research group virtual fence allow to use their data

The project “VSuper-G virtual fencing” started in Slovenia 2023.

NoFence is one and only manufacturer of Virtual fence systems in Europe.

Slovenia received the equipment with help Irish institute AFBI.

Marija Klopčič leads the Slovenian partner University of Ljubljana



Thanks PhD Marija Klopčič provide and allowed us to use project data and pictures

Virtual fence experiment 2023

4 partner institutes
conducting
experiments

Research leads:

- **AFBI** –Conor Holohan, Francis Lively
- **University of Göttingen** – Juliane Horn, Johannes Isselstein, Martin Komainda, Friederike Riesch, Bettina Tonn
- **University of Ljubljana** – Marija Klopčič
- **Swedish University of Agricultural Sciences / RISE** – Matt Hiron, Lotten Wahlund
- **AgriSearch and ADAS** – Jason Rankin, Sarah Brown, Paul Newell-Price

Irland virtual fence experiment 2023

Electric pulse:

0,2 J

3000 V

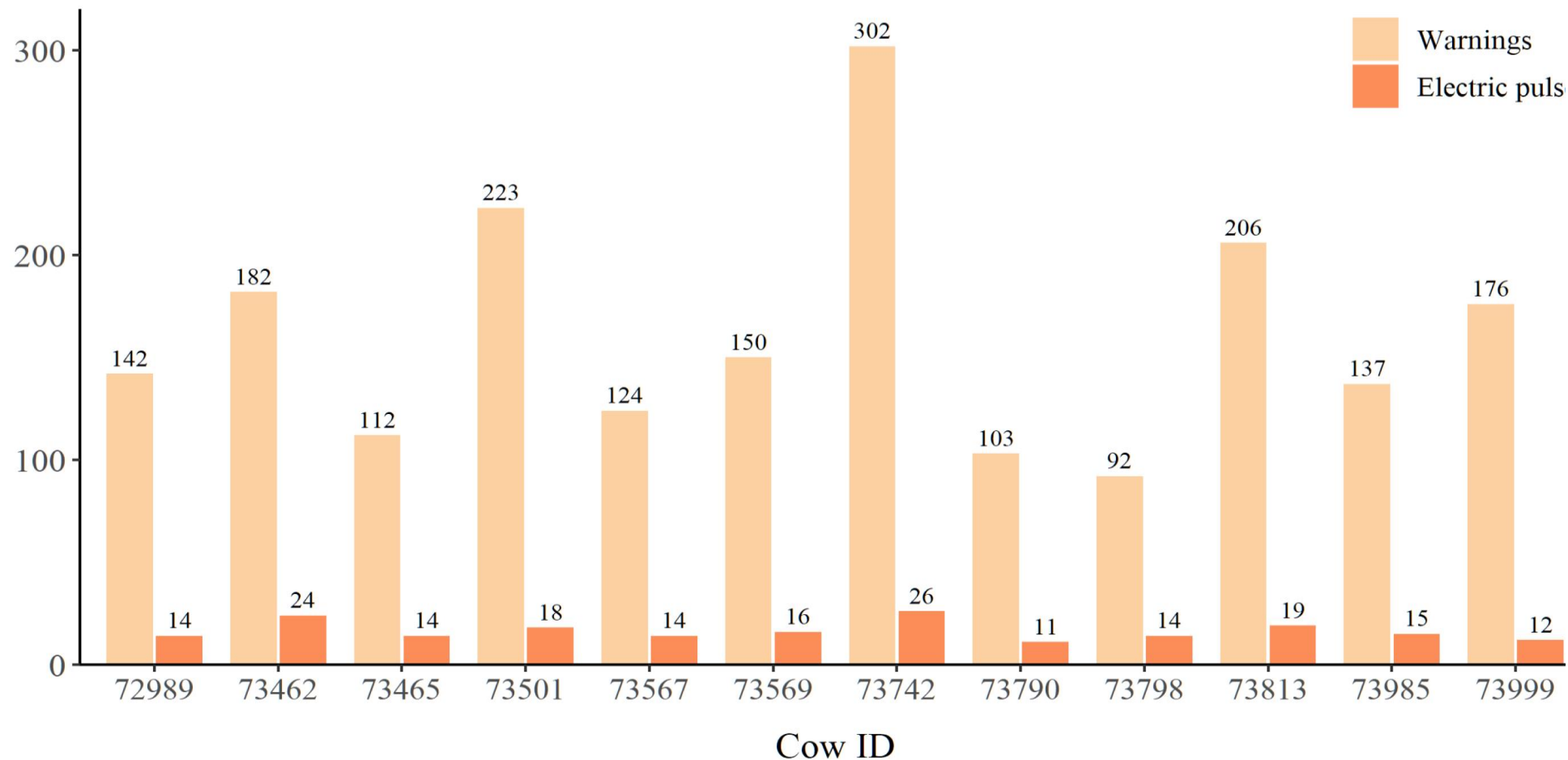
1sec

max 3 pulses at
border cross

Warning:

82 dB

Approx. 5-20 sec



Electric pulses and warnings - 139 days

12 heifers:

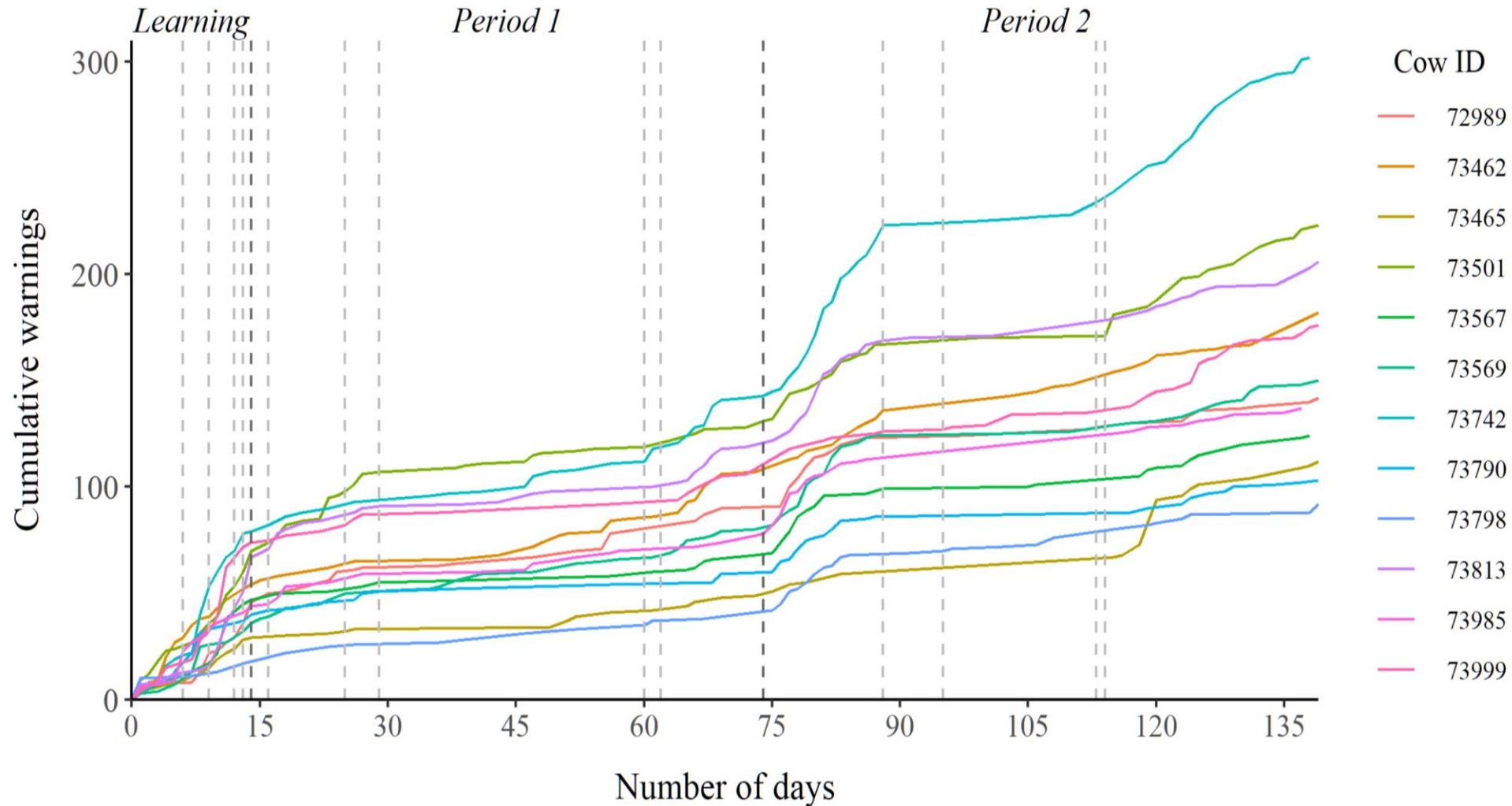
197 electric pulses

1949 warnings

1 heifer:

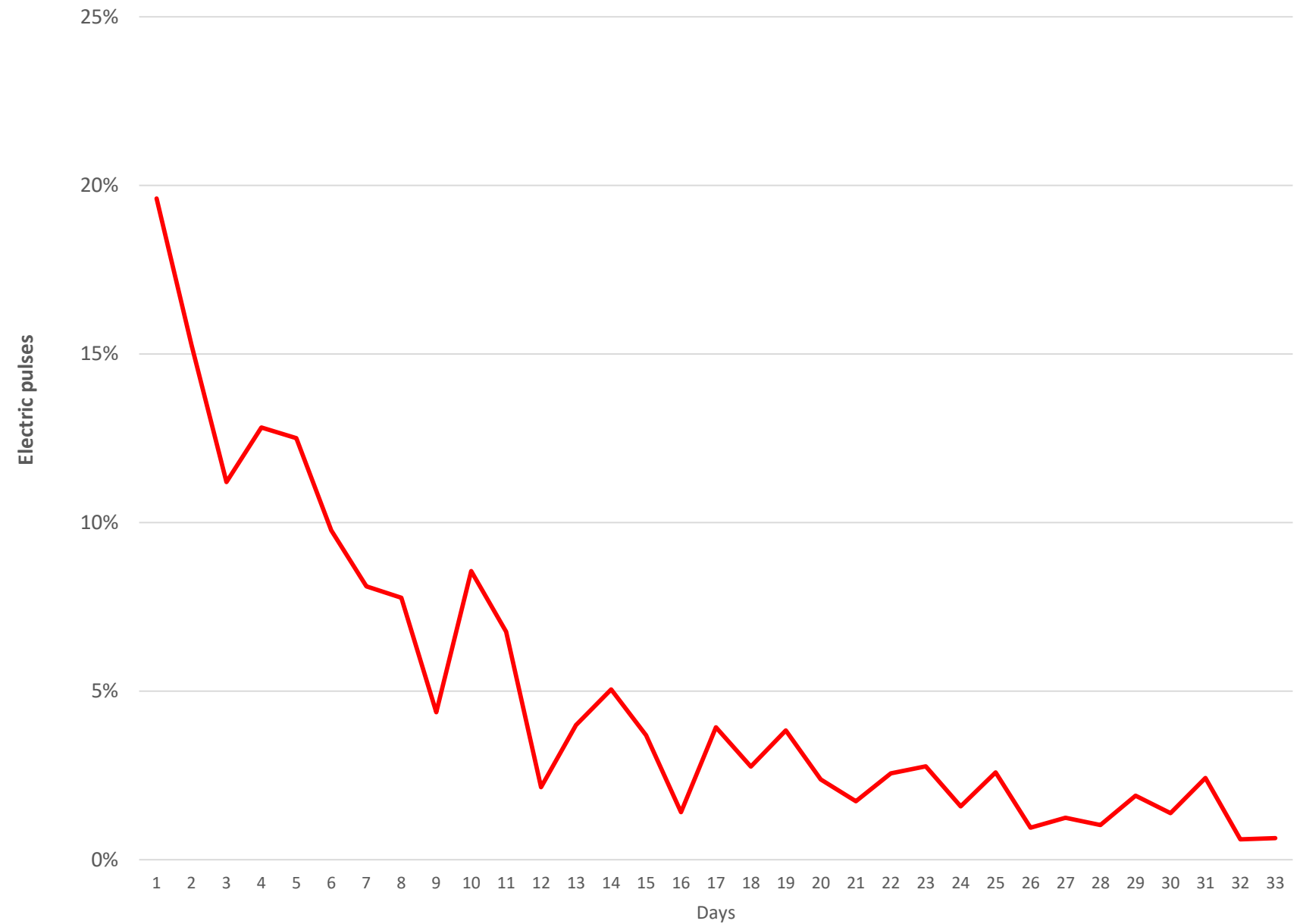
From 11 to 26 electric pulses

From 92 to 302 warnings



Pulses as a proportion of sound warnings

Even the stress factors after some days of use the virtual fence become very low.



Questionnaire about opinions for virtual fence use in Slovenia

1. Why?
2. What animals?
3. How long?
4. Change paddocks?
5. Was cattle quiet?
6. Electric vs. virtual fence
7. Problems?
8. Advantages?
9. Beast?
10. Will you repeat virtual fence use?



Bled 2022, virtual fence opinion

Bojan Frelj - shepherd

1. Experiment 2 herds - virtual vs. electric
2. 2x2x5 non pregnant B&W heifers
3. 2x2 months
4. Spread paddocks
5. Old cows nearby
6. Virtual and electric fences effectiveness almost the same
7. No problems
8. Not need to install classic fence
9. The beast was not nearby
10. **Yes**



Gorenje Ponikve 2023, virtual fence opinion

Anton Kukenberger - owner

1. Experience test with virtual fence
2. 5 collars + 5 normal milking cows together
3. 2 months
4. Spread step, narrow paddock from bottom to top, from 2/3 to 3/3, surrounded with electric fence
5. One collar's cow 2 times out and than alone back
6. Virtual and electric fences work together
7. No problems
8. Not need to install classic fence
9. The beast was not nearby
10. **Yes**



Three Mile Island nuclear disaster has to be in our mind when we use the electronic equipment on very intensive way, always

1. Happened a partial meltdown in 1979
2. Susquehanna River in Londonderry Township, near Harrisburg, Pennsylvania, USA.
3. The main reason for tragedy was too many information in short time
4. People did not trust to their own observation and knowledge



Machines + computers + robots + instruments will newer interchange the Shepherd

Slovenian people (Venets) in Julian Alps breed and grazed Drežniška goat for more than 7.000 years. Now we know this from molecular genetic researches.

Paradox: such genetic findings are possible with extraordinary technologically advanced instruments only.



Virtual fences on WEB

FILMS

<https://www.youtube.com/watch?v=YyhiBibtzoE>

<https://www.youtube.com/watch?v=EihJuqlOmDc>

<https://www.youtube.com/watch?v=XB9582EO8rc>

<https://am.gallagher.com/en/new-products/eShepherd>

WEB PAGES FROM PRODUCERS

<https://www.nofence.no/en/>

<https://account.nofence.no/quick-quote/> **QUESTIONNAIRE FOR USERS**

<https://am.gallagher.com/en/new-products/eShepherd>

<https://am.gallagher.com/en/News/eShepherd-cellular-connectivity>

NO ONE OF PRODUCERS SENT TO US THE PROFORMA INVOICE

Idea: Virtual fence for beasts

Virtual fence could be put on bears, wolfs and jackals as states (at least Slovenia and some of other EU states) spend high amount resources to beasts exaggerated support natural environment.

If shepherds with very short incomes have to protect our domestic animals than states with very high resources have to protect wild animals, beasts inside protected areas – National, Landscape, Preserve parks,...



Democritus from Abdera around 500 BC:

“I would rather find a single causal relationship than become the king of Persia.”

www.pastinnova.site



THANK YOU FOR YOUR ATENTION!

**SEE YOU AT THE NEW KICK OFF
MEETING FOR **PASTINNOVA 2.0** IN
2025**

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PASTINNOVA



PRIMA
PROGRAMME FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA

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