

GREENFIELD SMART COLLARS



Focus and perspective

- **On-farm** sensor applications as part of a **precision livestock farming** (PLF) approach
- Predominantly **ruminant** livestock, and also predominantly **dairy cows**
- Precision farming is about measuring and managing the **variability** in biological resources, ideally at the **individual** animal level
- Dairy farming is at the forefront in this respect



Electronic identification (EID)

- The full PLF approach requires the automatic identification of individual animals
- EID is the 'backbone' of PLF systems
- Predominantly based on passive radio-frequency identification (RFID) tags
- Early systems combined EID with simple motion sensors (pedometers) to detect the increase in activity during oestrus



Rumination monitoring

- First used to detect oestrus
- Oestrus = ↓eating = ↓ruminating
- 'Simple' signal *cf.* eating
- SCR **VocalTag** (microphone-based neck collar)
- SCR **Heatime** (accelerometer based, probably using eating time?)
- **SmartBow** (eartag accelerometer, also gives cow position)



Bioacoustics

Microphone Radio transmitter

Radio receiver
connected to
video camera
i.e. the sound
you will hear
in the video is
transmitted
from the
cow's head



Noseband → 'IGER' Behaviour Recorder



Precision grazing management



- Monitor herbage availability (e.g. bite:chew ratios)
- Automatically open fence at optimum sward depletion level (timed to e.g. not coincide with milking)



Rumination activity

- Cows are generally stationary when ruminating (lying down or standing still), and they only perform one type of jaw movement (chewing)
- In contrast, foraging animals are engaged bites, chews, chew-bites and body movements:
 - Head movements at a feed face
 - Head and body movement when grazing
- Consequently, accelerometer signals from animals that are eating are very complex



Benefits & ROI

- **Early illness detection** cuts vet costs and mortality
- **Accurate heat detection** raises conception rates
- **Healthier herds** deliver higher, steadier milk yield
- **24/7 monitoring** replaces manual checks and lowers labour
- **Positive ROI** that grows with herd size



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How it works

1



Collar sensors

Accelerometer & temperature sensors track behaviour 24/7

2



Wireless transmission

Data sent to an on-farm gateway every few minutes

3



Cloud analytics

Algorithms detect patterns and flag anomalies

4



Farmer alerts

Health & heat alerts delivered straight to your phone



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Key specifications



Sensors

3-axis accelerometer + skin temperature



Metrics tracked

Rumination, activity, feeding, rest & heat. Optional GPS location feature.



Battery life

Up to 5 years, no recharging



Connectivity

Wireless gateway, up to 1 km range



Data refresh

New readings every 15–20 minutes



Durability

IP67 waterproof, rugged webbing strap



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Use cases



Heat detection

Pinpoint the optimal insemination window to lift conception rates



Calving alerts

Get notified as calving nears so you can be there in time



Early illness detection

Falling rumination and activity flag sick cows before clinical signs



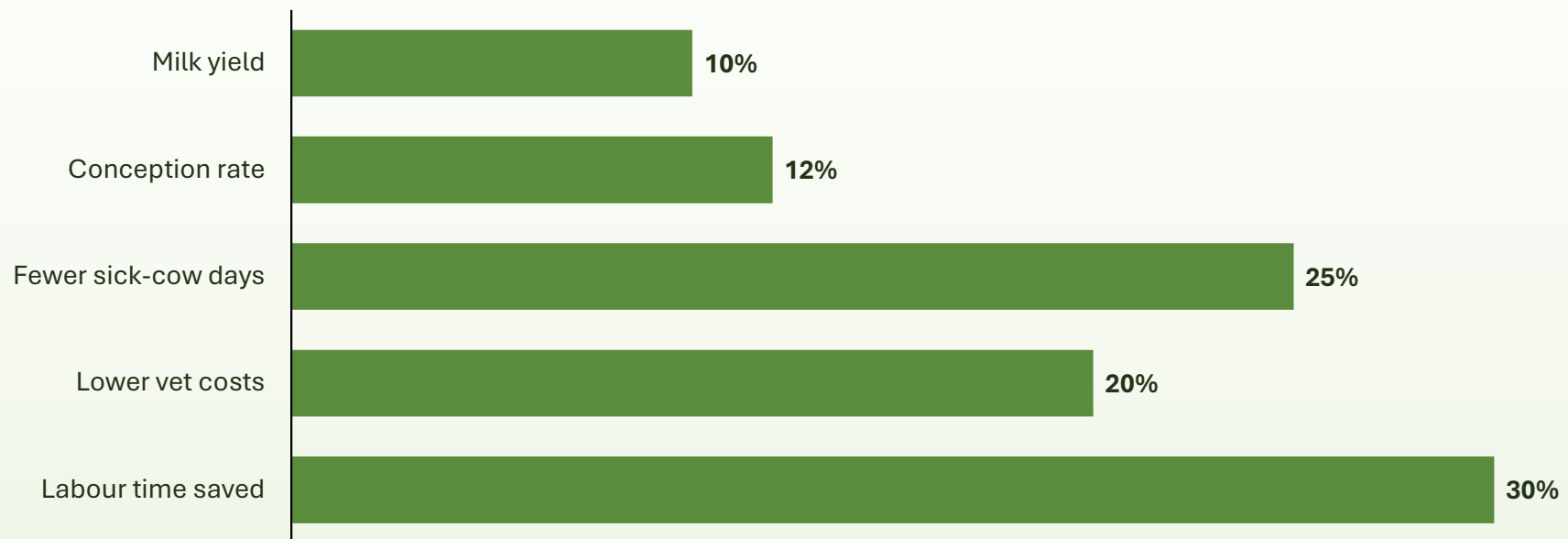
Heat-stress management

Spot heat-stressed cows and adjust shade, water and feeding



Return on investment

Typical improvement with smart collars



Illustrative figures based on published dairy smart-collar studies; actual results vary by herd.



Ready to transform your herd?



Healthier cows

24/7 monitoring flags illness early



Higher productivity

More milk and better fertility



Stronger returns

Lower costs and a fast payback

Contact amo@GreenTechnologyGlobal.com for further information



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