

Dairy Farming Challenges and Opportunities

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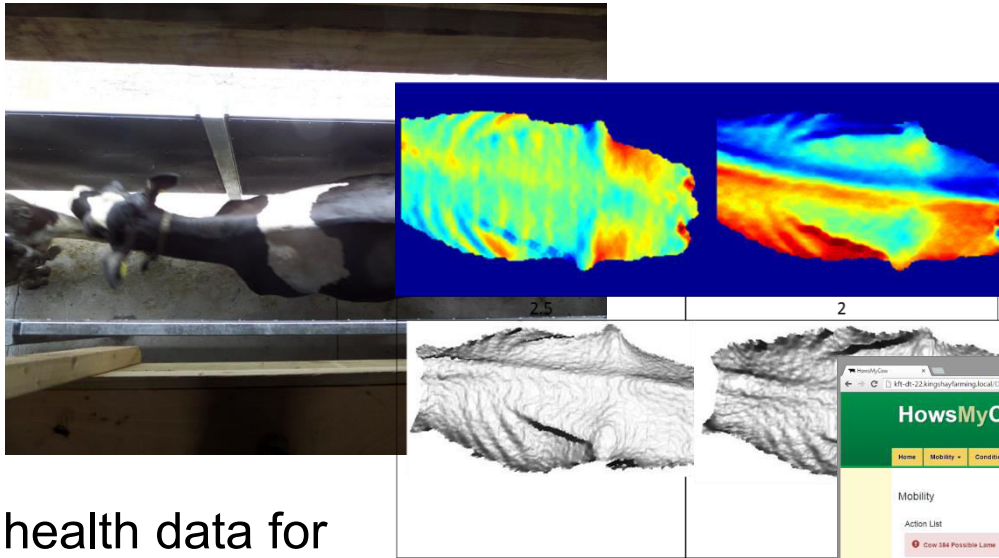


How's My Cow

Innovate UK
Technology Strategy Board

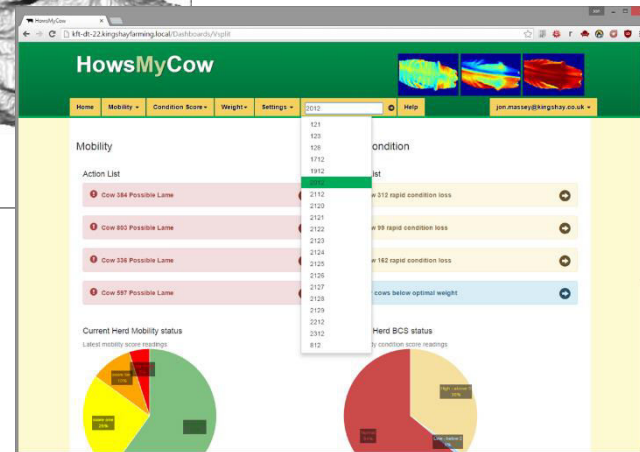


- **Machine Vision for Better Cow Health**
- Innovate UK funded working with Bristol Robotics Lab



- **Body Condition Scoring**
- **Mobility Scoring**
- **Weight**

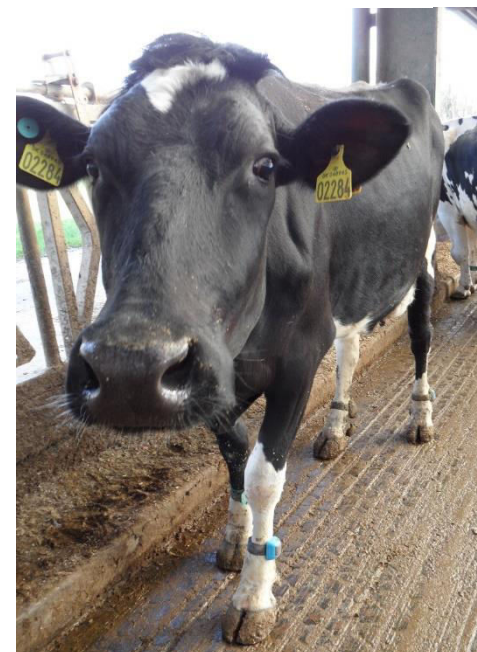
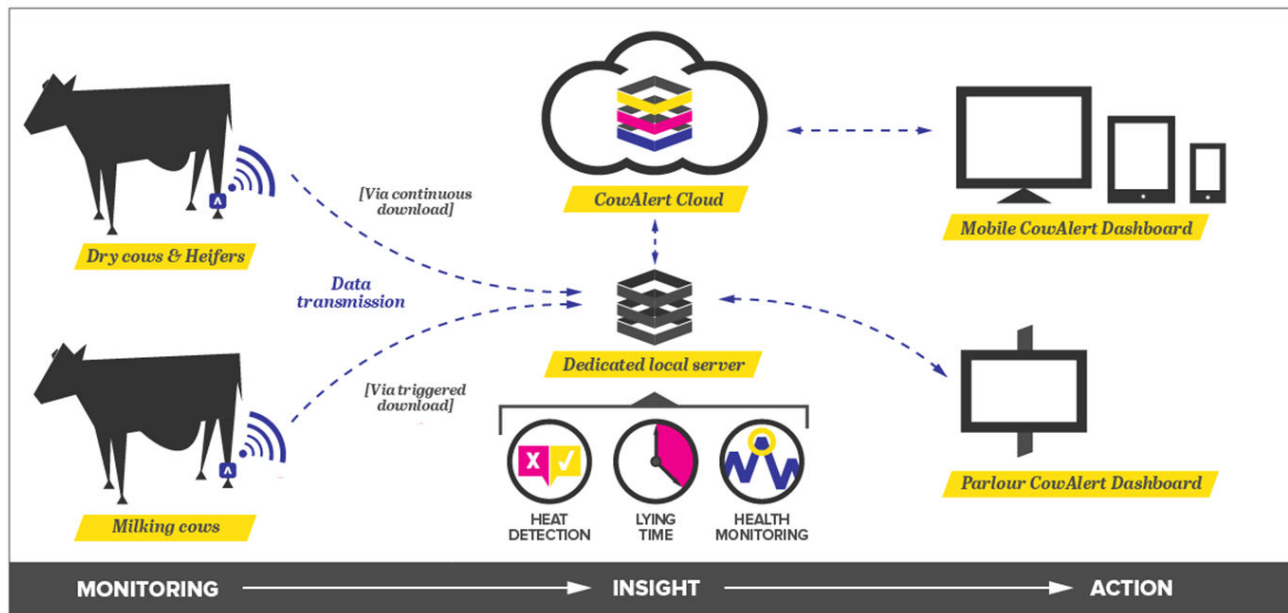
Key health data for
Farmers, Nutritionists,
Vets, Researchers, Geneticists



Pioneering use of accelerometry in dairy farming

- INTEGRATION
- PERFORMANCE
- VALIDATION

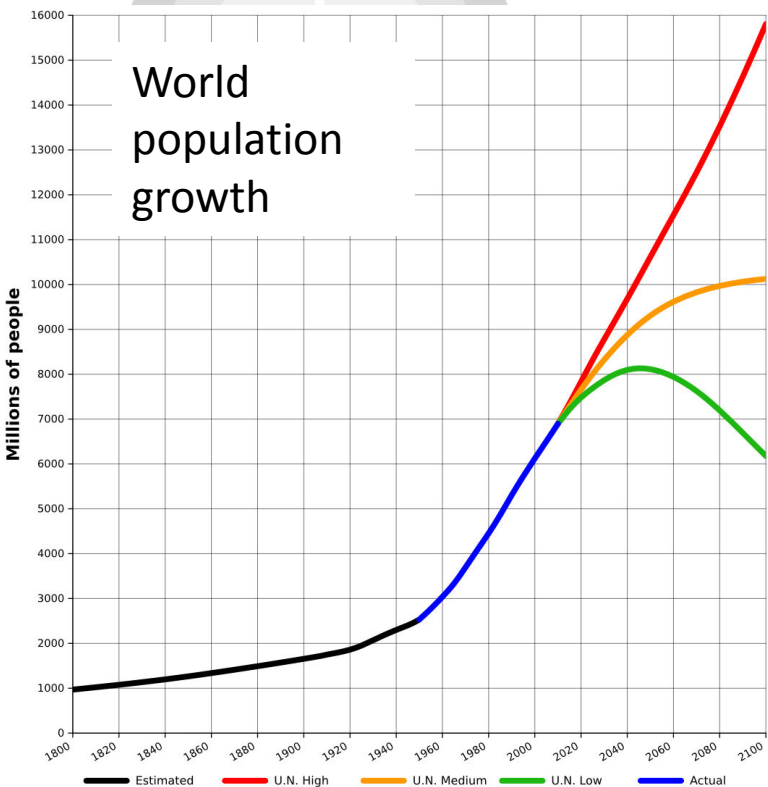
COWALERT



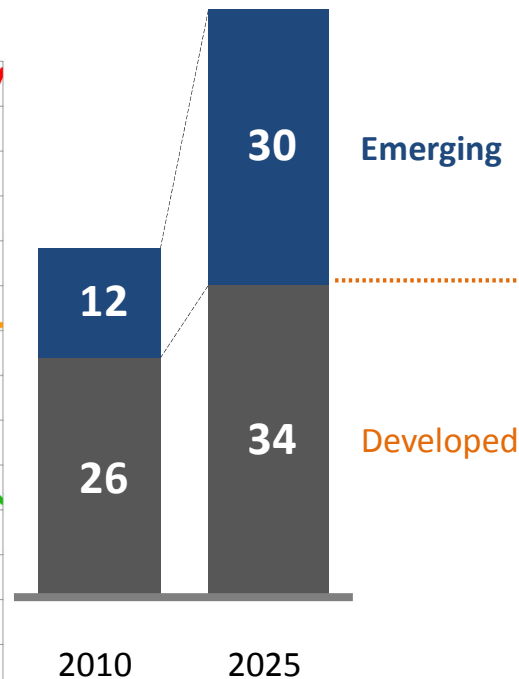
Longer term outlook

World consuming class
2.4bn (2010) 4.2bn (2025)

Consumption in emerging
markets will grow by 150%

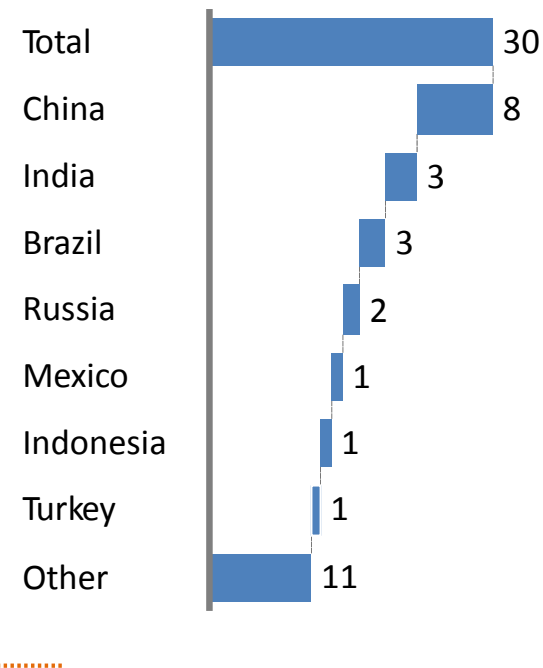


World consumption
\$ trillion



\$30 trillion

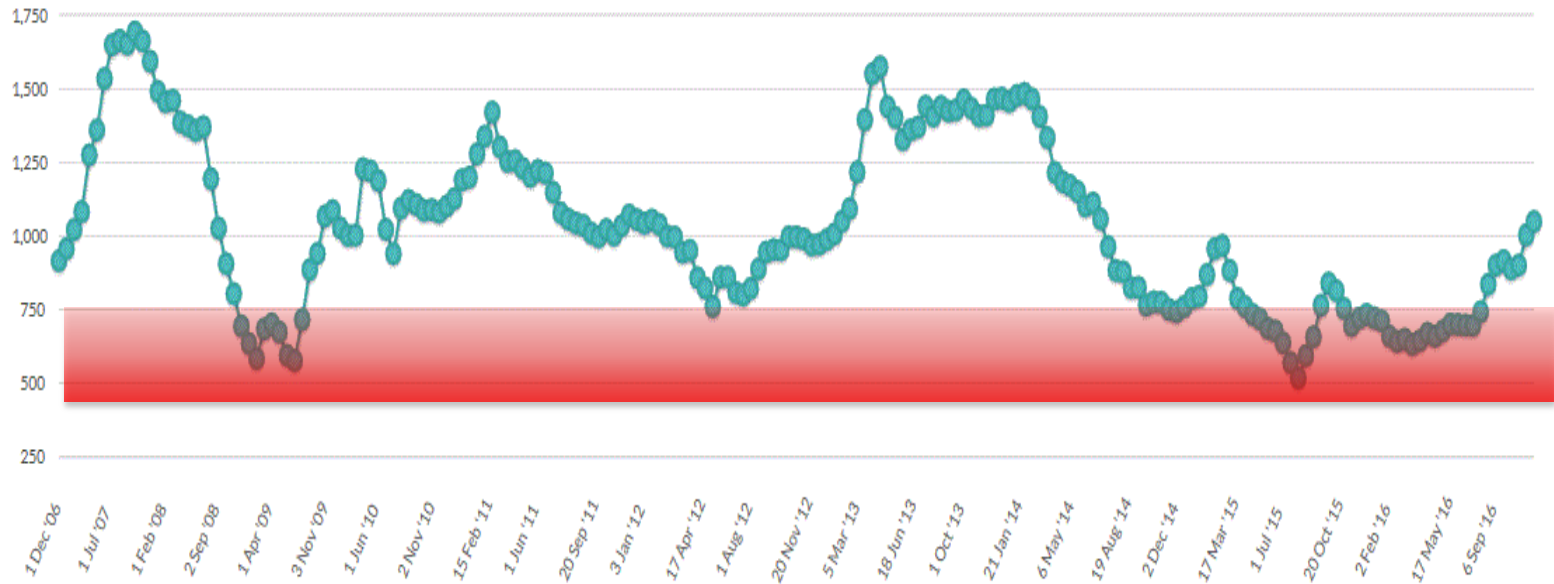
**Consumption in emerging markets
in 2025**



SOURCE: McKinsey Global Institute

Global Dairy Trade

Price index over 10 years

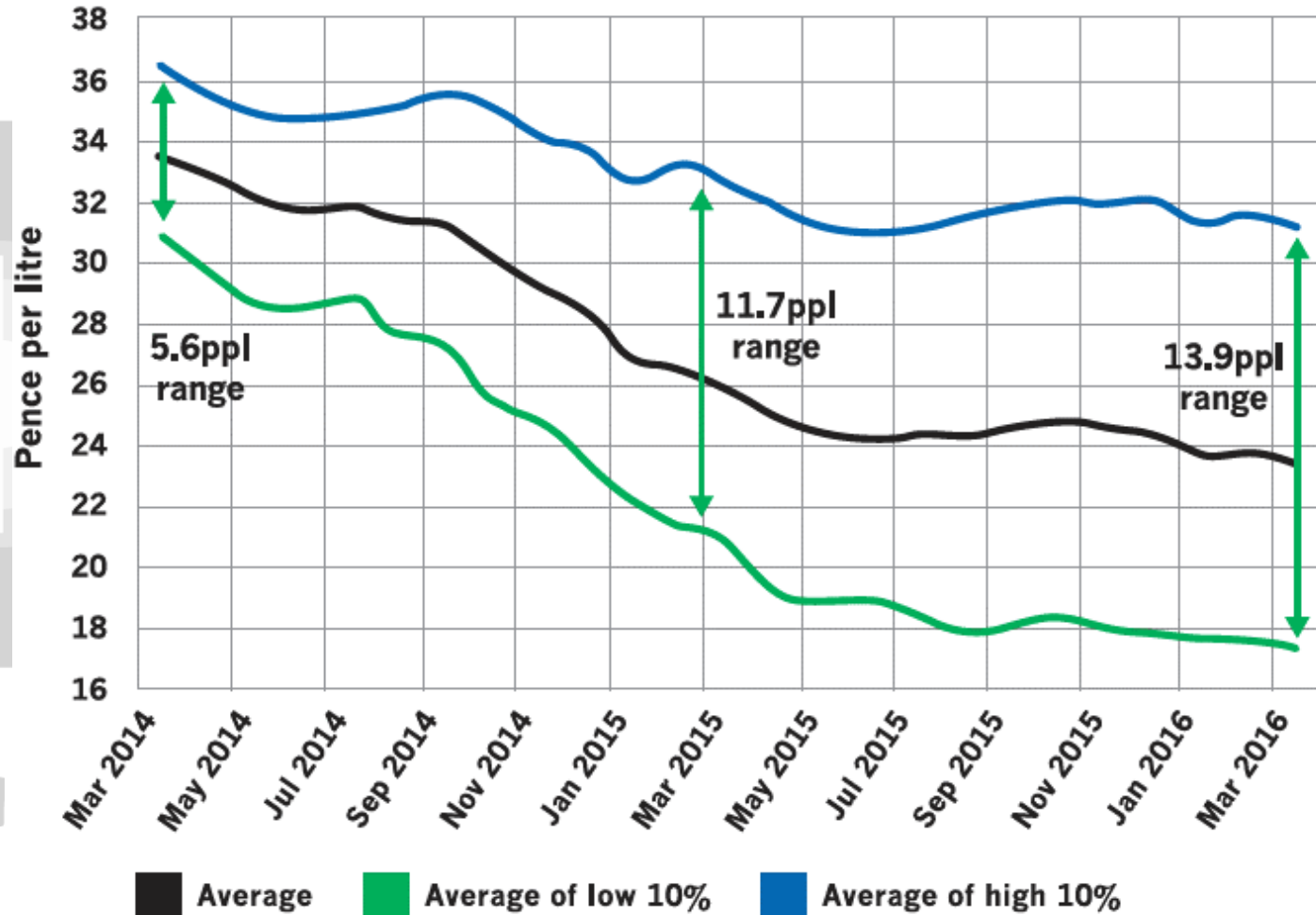


Source: Global Dairy Trade

Global milk prices are just emerging from the worst and most prolonged period of depressed prices in 10 years

Milk price in UK

Widening gap between best and worst prices paid



Potential in Dairying

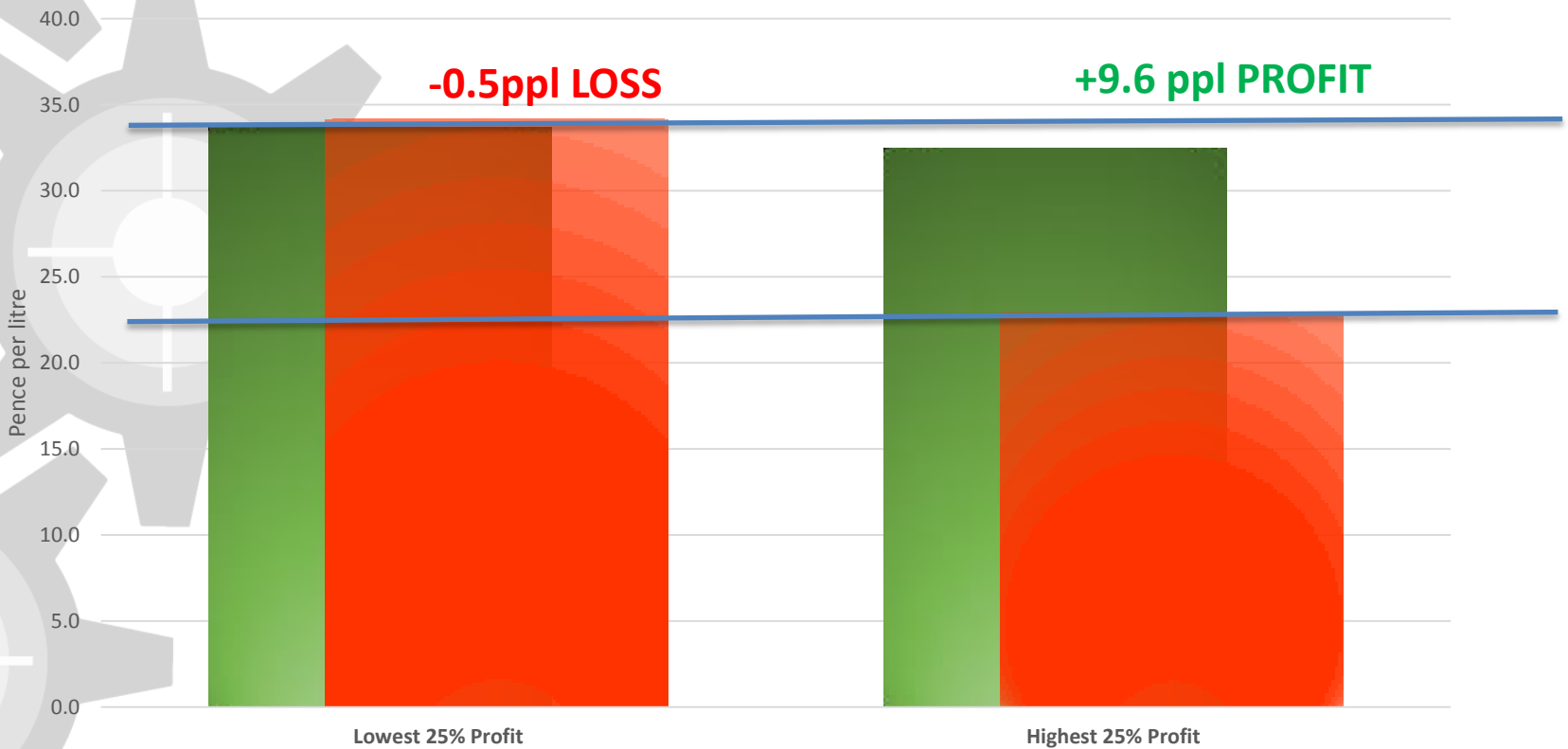
- Massive range in dairy **profitability** across farms
 - Milk price is a major factor but it's.....
 - Not just about milk price
- **Variability** at all levels
 - Business
 - Herd
 - Animal
 - Environment

Measure, monitor, manage

Business Profitability

Output vs Costs

■ Output ■ Costs



Animal performance

- Two cows: similar genetic merit in the same herd

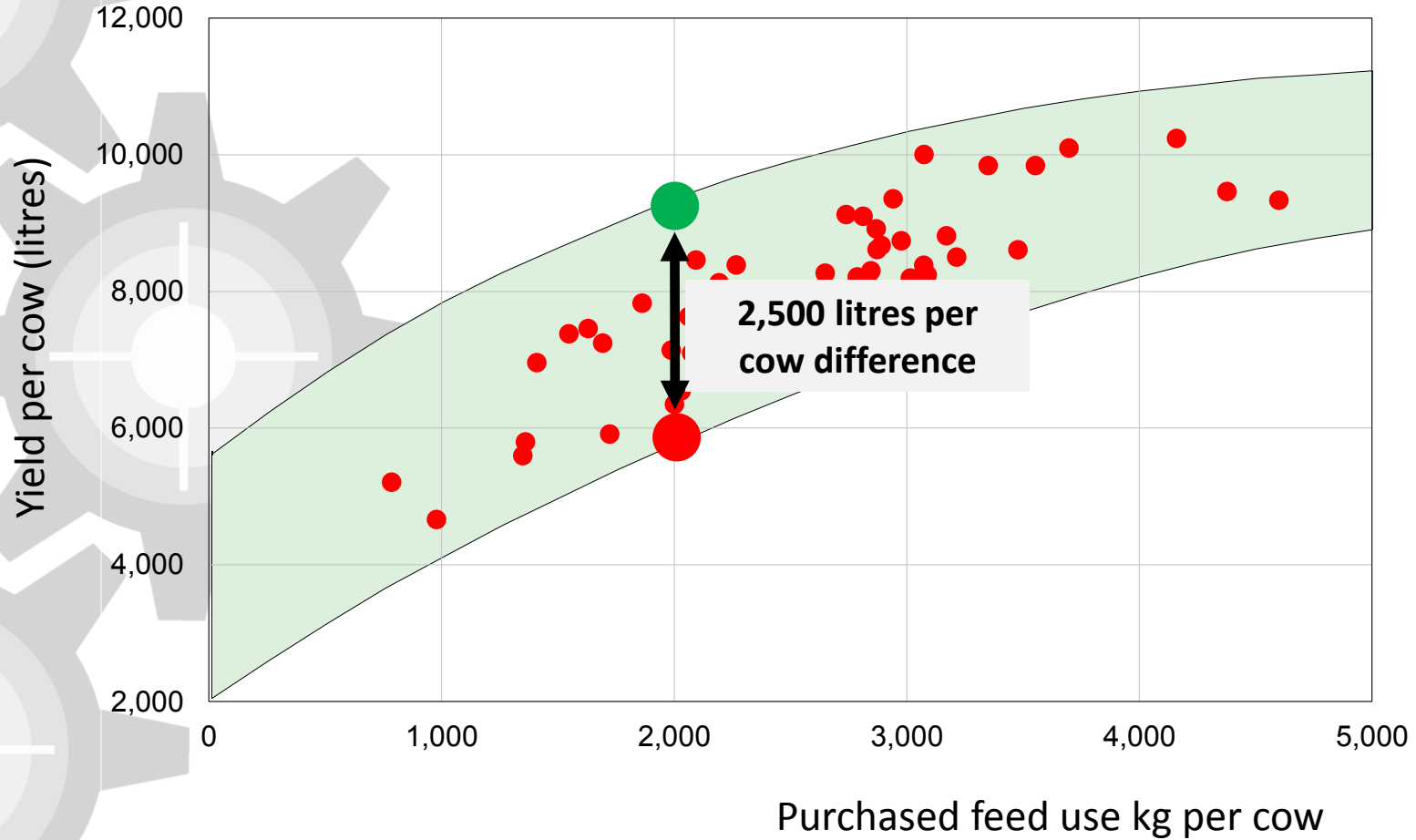
Cow no.	Lactation No.	Milk Yield 305 day kg	Average butterfat	Average protein
388	3	12,615	3.95%	3.33%
693	3	3,317	3.88%	3.12%

- Both have completed 3 lactations under
 - same herd
 - same management
 - same environment
- Massive performance **difference**
- **Opportunities** to learn more about what makes a top performer



Feed Efficiency

Kingshay Milk Map ©



Source: Kingshay Dairy Manager

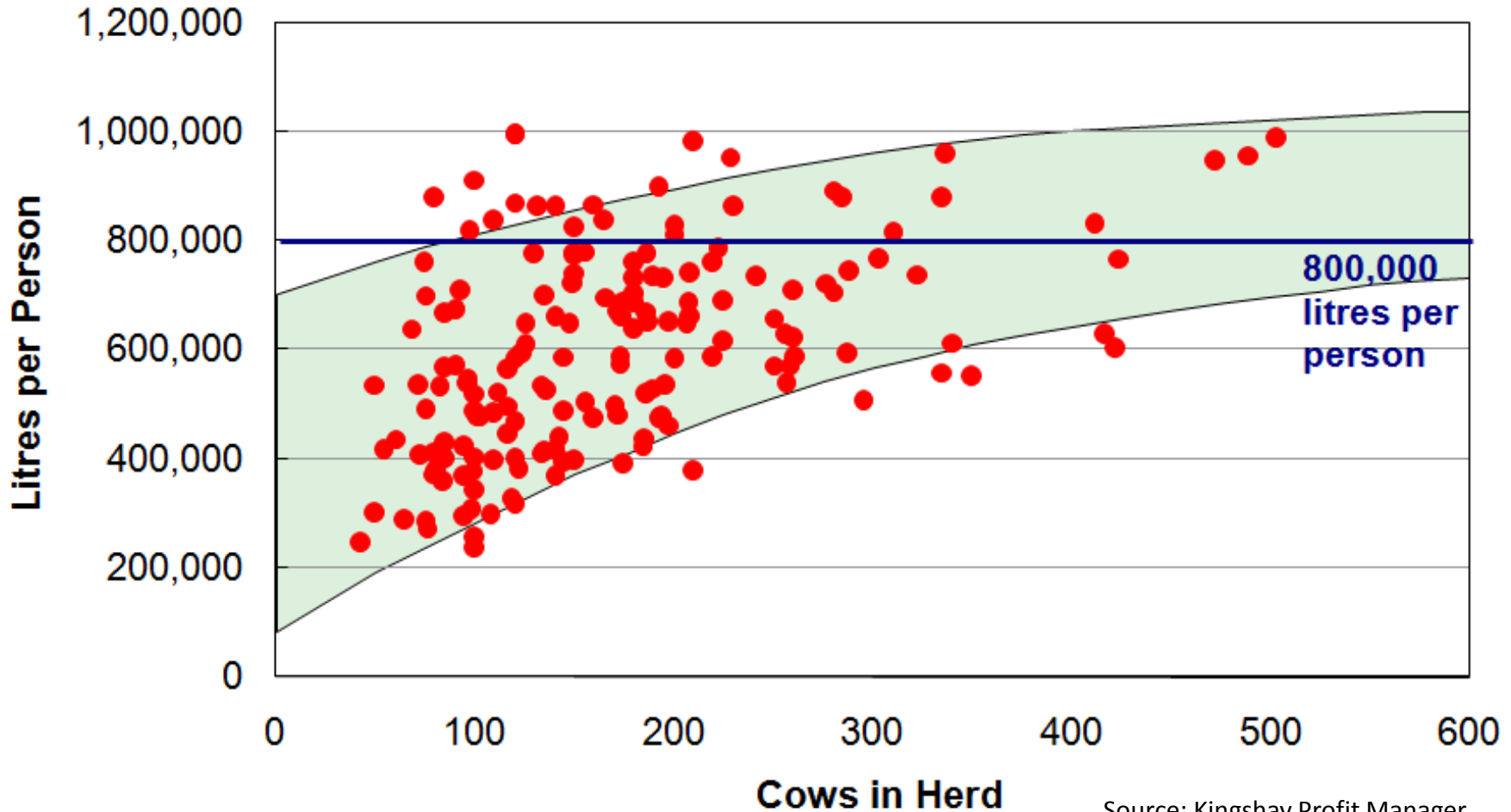
Milk from Forage

7,000 to 8,000 litre herds	Highest 25% Milk from Forage	Lowest 25% Milk from Forage
Yield per Cow (litres)	7,485	7,588
Yield from Forage (litres)	3,865 (52%)	1,507 (20%)
All Purchased Feed Cost (p/litre)	5.41	8.39
Saving (p/litre)	2.98	

Savings of **£33,578** for a typical 150 cow herd

Source: Kingshay Dairy Manager

Labour Efficiency



Source: Kingshay Profit Manager

Business Sustainability

- Exploit the peaks
- Survive the troughs
- **Measurement:** The key to management
- **Precision:** The key to informed decisions
- **Opportunities** at every level to make variability a positive asset

Measure, monitor, manage

Potential for better technology to meet livestock needs

Key indicators of cow wellbeing:

- Food intake, rumination, temperature, activity, mobility, milk quantity and quality, dung quality and many more.....

Key promoters of cow wellbeing :

- Air exchange, temperature control, humidity control,
- Space, light intensity, bed design, access to food and water, floor surface, waste removal and many more.....

**Some of these are addressed by existing technology
Others need innovators to get involved**

Agri Tech Centres

Funding flow chart: Agri-EPI Dairy Centres


Department for
Business, Energy
& Industrial Strategy
Innovate UK


AGRIEPI CENTRE
Engineering • Precision • Innovation


CIEL Centre for Innovation
Excellence in Livestock


CHAP
CROP HEALTH & PROTECTION

 **agri metrics**

DAIRY


Kingshay

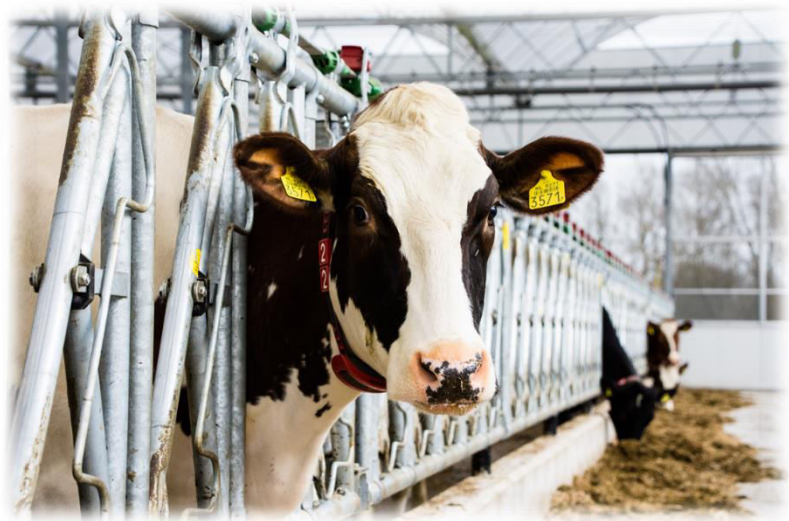

**Harper Adams
University**


SRUC

ARABLE

HORTICULTURE

AQUACULTURE




AGRIEPI CENTRE
Engineering • Precision • Innovation



AGRIEPICENTRE

Engineering • Precision • Innovation

Dairy Centres

Three main dairy centres
and a satellite



- SRUC Crichton Royal - Dumfries



- Harper Adams University - Shropshire



- Kingshay - Somerset

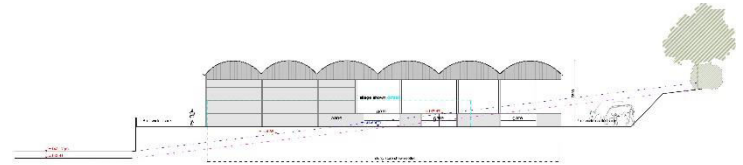


AGRIEPICENTRE

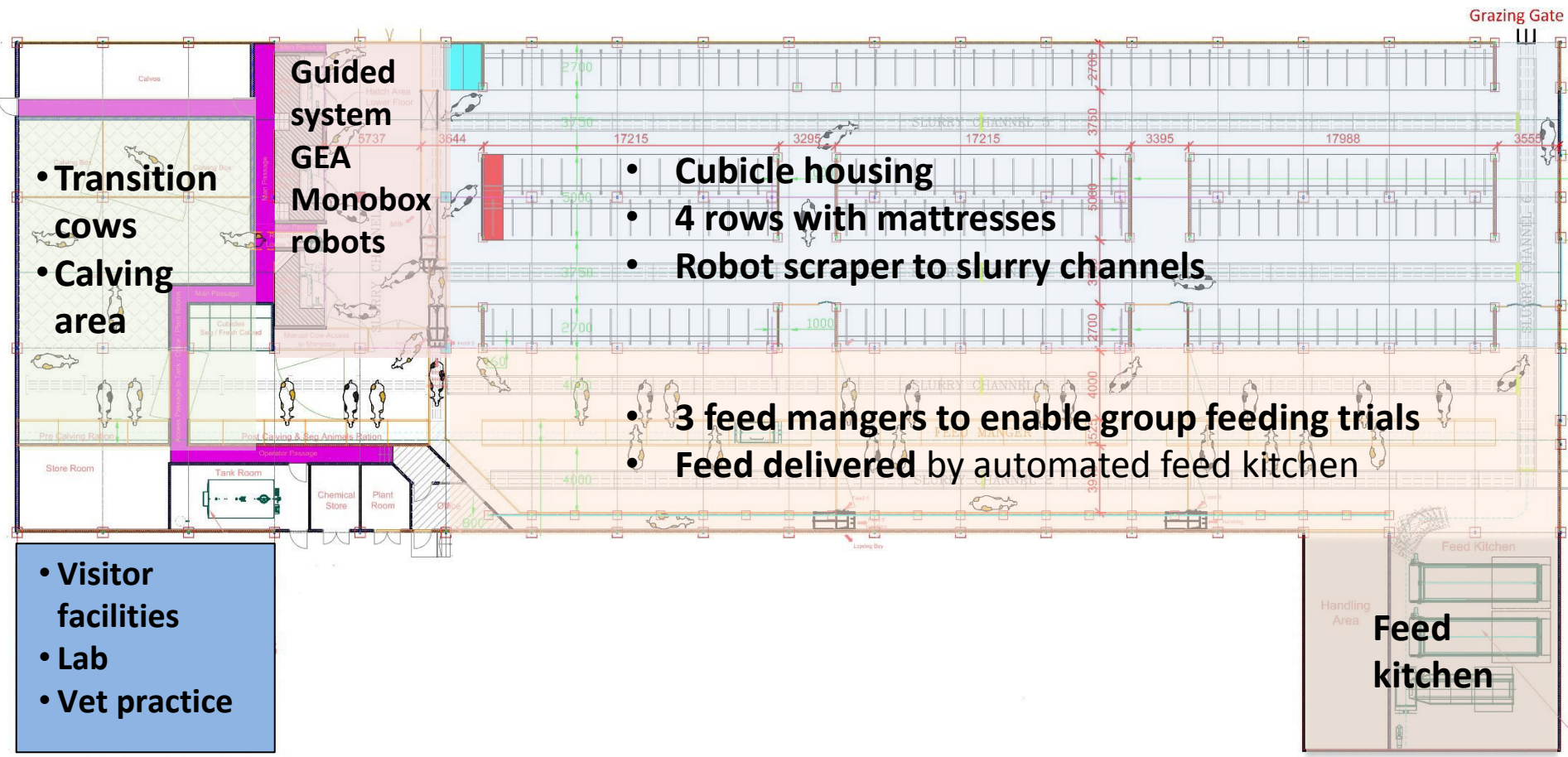
Engineering • Precision • Innovation

South West Dairy Research and Demonstration Unit

Combining State-of-the-Art Housing with Precision Grazing



Dairy Unit development



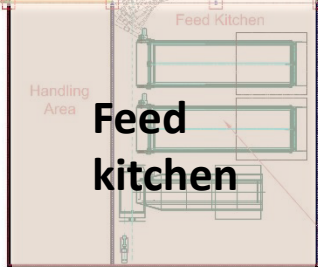
- Transition cows
- Calving area

**Guided system
GEA
Monobox
robots**

- Cubicle housing
- 4 rows with mattresses
- Robot scraper to slurry channels

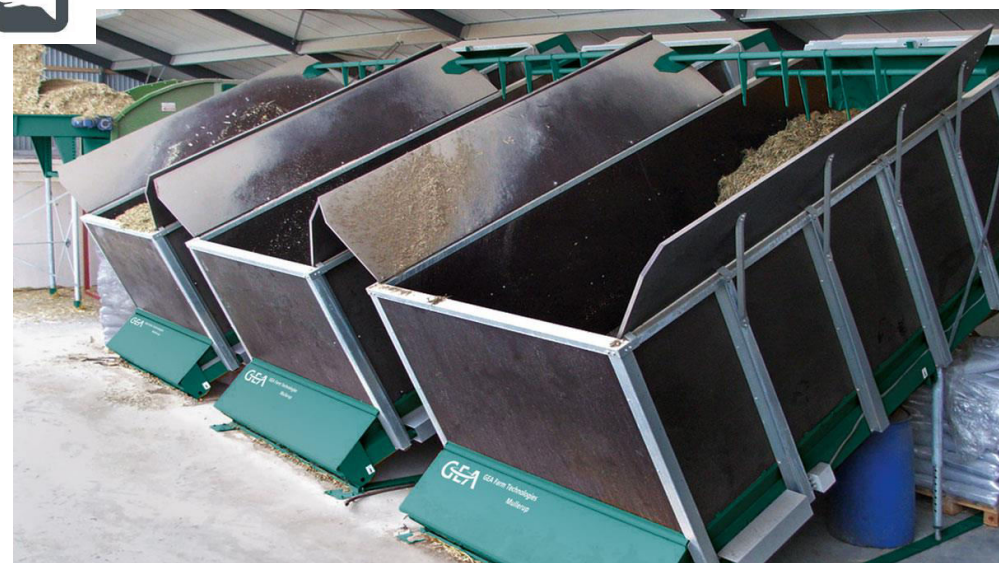
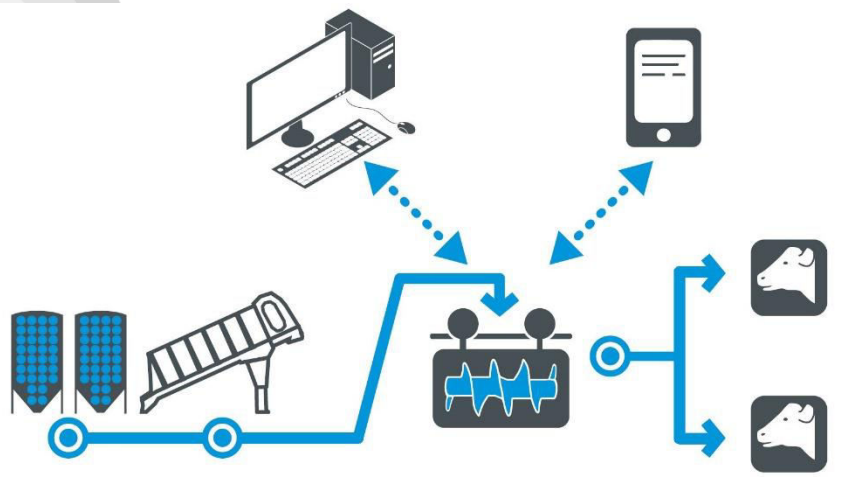
- 3 feed mangers to enable group feeding trials
- Feed delivered by automated feed kitchen

- Visitor facilities
- Lab
- Vet practice

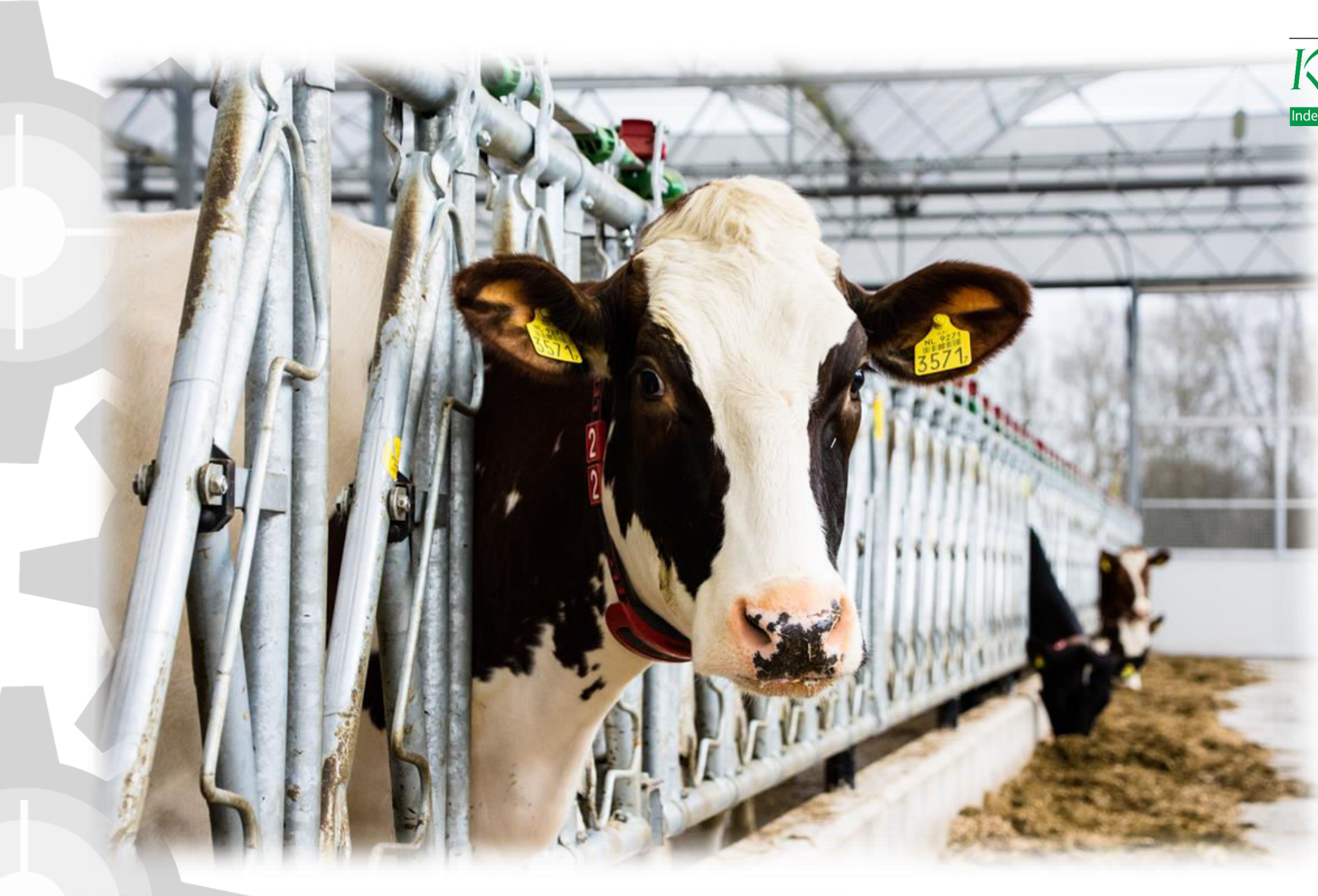


State of the Art building design

Automated precision feeding system



GEA Mullerup auto feeding to deliver precision diets up to 7 times a day



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