



# Sheep Breeders Round Table November 2022

## Agriculture's net zero challenge: the options for sheep



# World-leading research alliance

Bringing new technologies and processes to livestock and aquatic food production



Gene Technologies

Nutrition & Productivity

Health, Welfare & Behaviour

AMR

Resource Efficiency

Environmental Impact

Food Production pre/post-farmgate

Food Safety, Quality & Integrity



## National Research Network

Working in partnership with leading livestock and aquatic research institutions



## ≈900 Researchers

Collaborative network tackling the grand challenges facing the agrifood and aquaculture industry



## ≈70 Industry Members

Covering all aspects of the food supply chain from pre-farmgate, processors and retailers to animal health and SME innovators



## Multi-Departmental Government Partners

Working across UK Government including BEIS, UKRI, Innovate UK, Defra, DHSC, DIT and devolved administrations



## £70M Investment

Greatest joint investment in livestock research capability in a generation



## 26 Facilities

Capital investment in new or enhanced research facilities nationwide, spanning all livestock species



## >30,000 Livestock

Multiple research populations



## £££Ms Projects

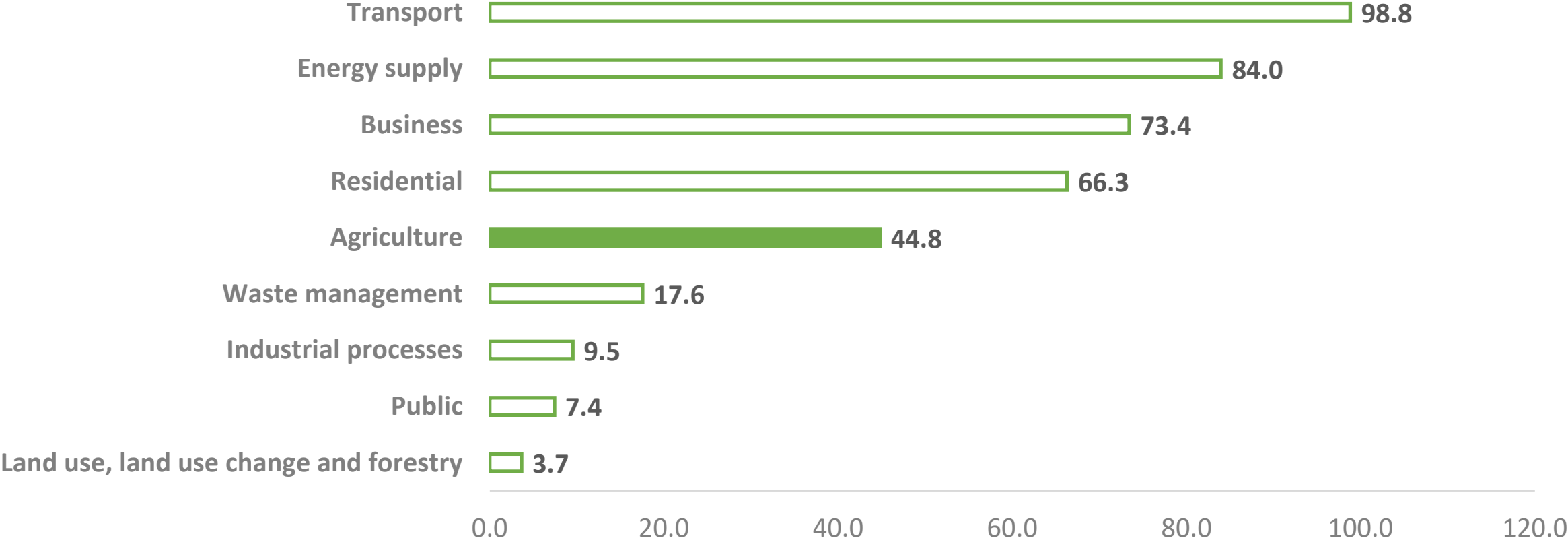
Projects managed and in the pipeline



# 11% of UK GHG Emissions from Agriculture



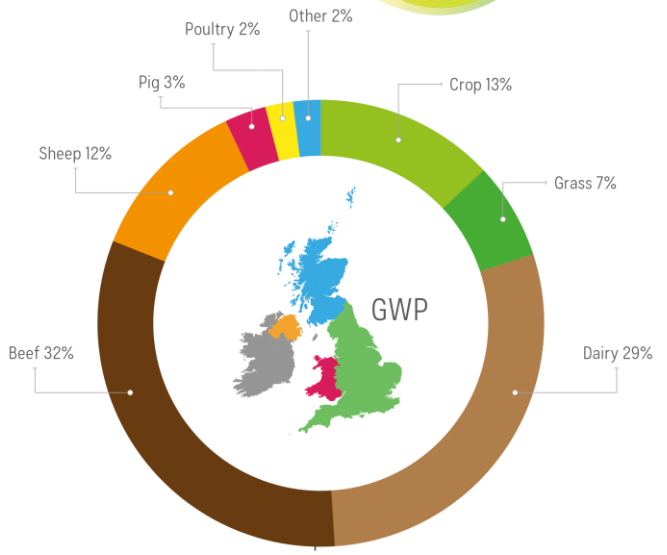
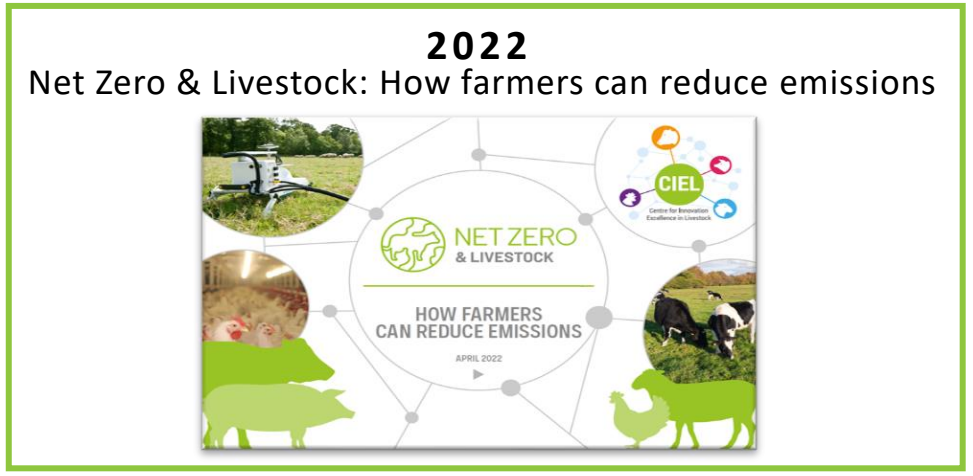
Estimated territorial greenhouse gas emissions by source category, by million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>e), UK 2020



# Our Net Zero Journey



**2020**  
Net Zero Carbon & UK Livestock



Sector Surgeries  
Pig & Poultry and  
Ruminants



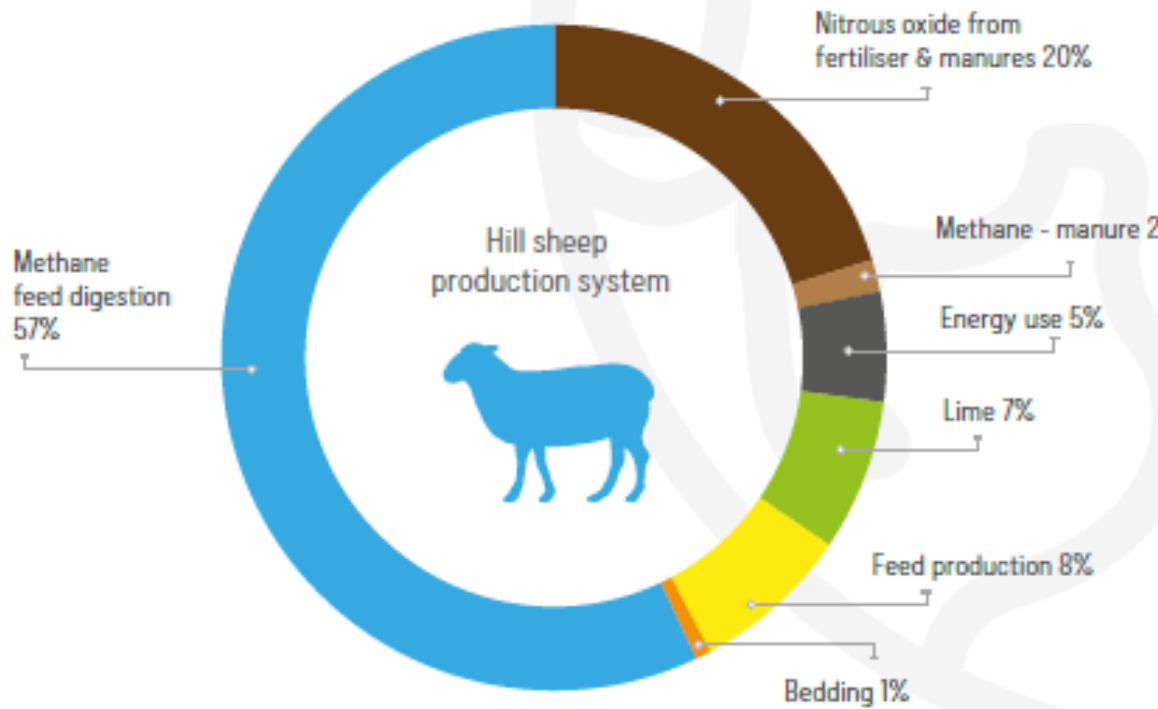
**2021**  
UN Climate Change Conference

**2023 – onwards**  
Next Steps Work

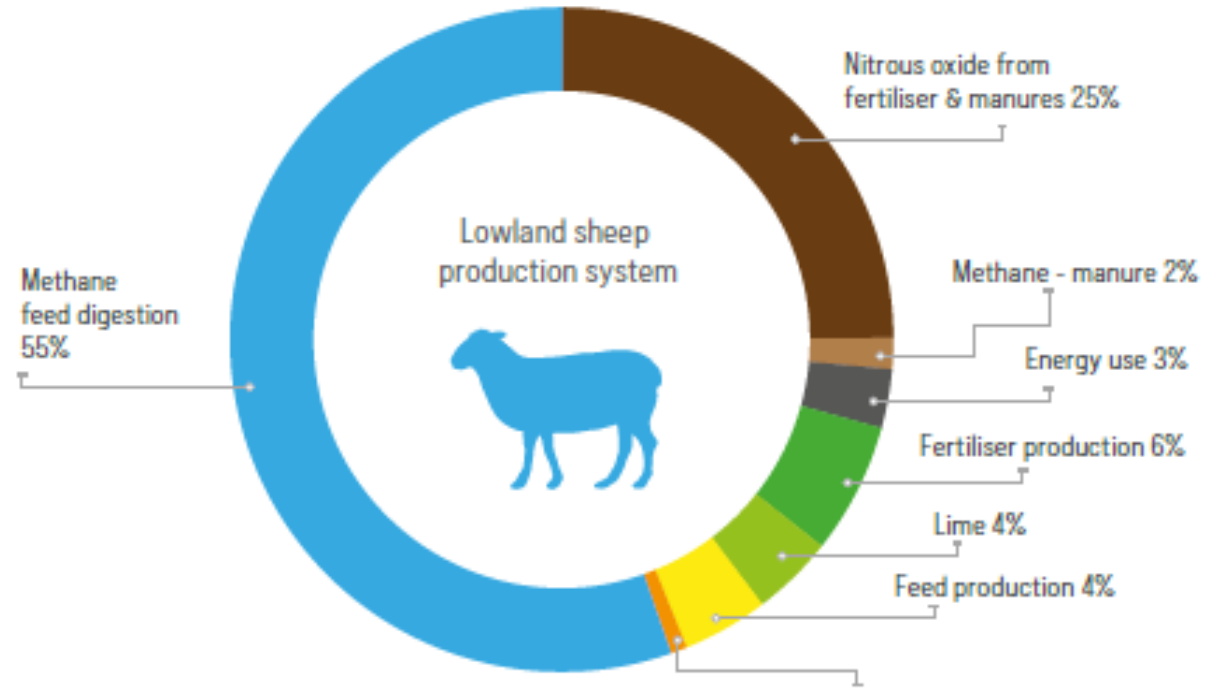
**2050**  
Reach UK ambition for Net Zero



# Average GHG emissions (hill & lowland farms)



Up to 67% reduction in emissions



Up to 37% reduction in emissions

# What Works?



## Feed

- Higher starch content diet
- Increasing dietary oil and fat content, dietary inclusion of oilseeds
- Low crude protein diets
- Feeding tannin- and saponin-rich forage
- Feeding CH<sub>4</sub> inhibitors
- Specialised feed ingredients/additives

## Animal

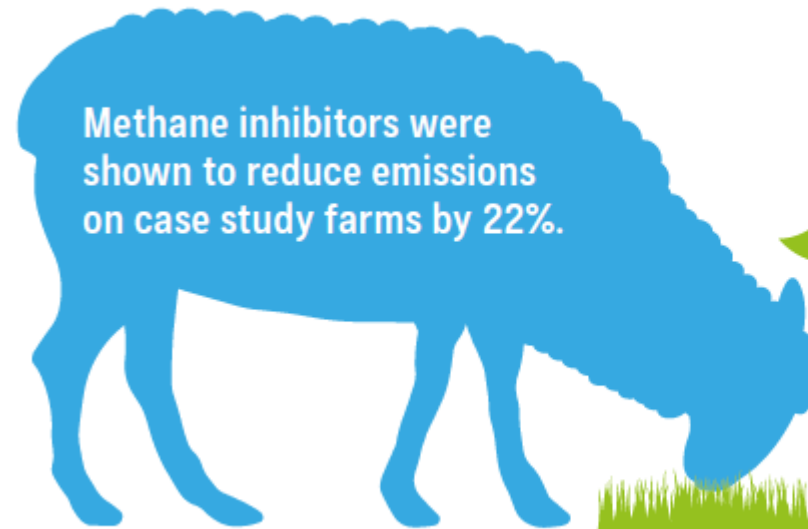
- Genetic selection for inherently low enteric methane emissions
- Genetic improvement
- Improved animal health
- Finish lambs at a younger age
- First mating of ewes as lambs rather than yearlings

## Forage

- Grass-legume mixtures, multi-species swards
- Improved forage quality

## Manure & Fertiliser

- Nitrification and urease inhibitors



Methane inhibitors were shown to reduce emissions on case study farms by 22%.



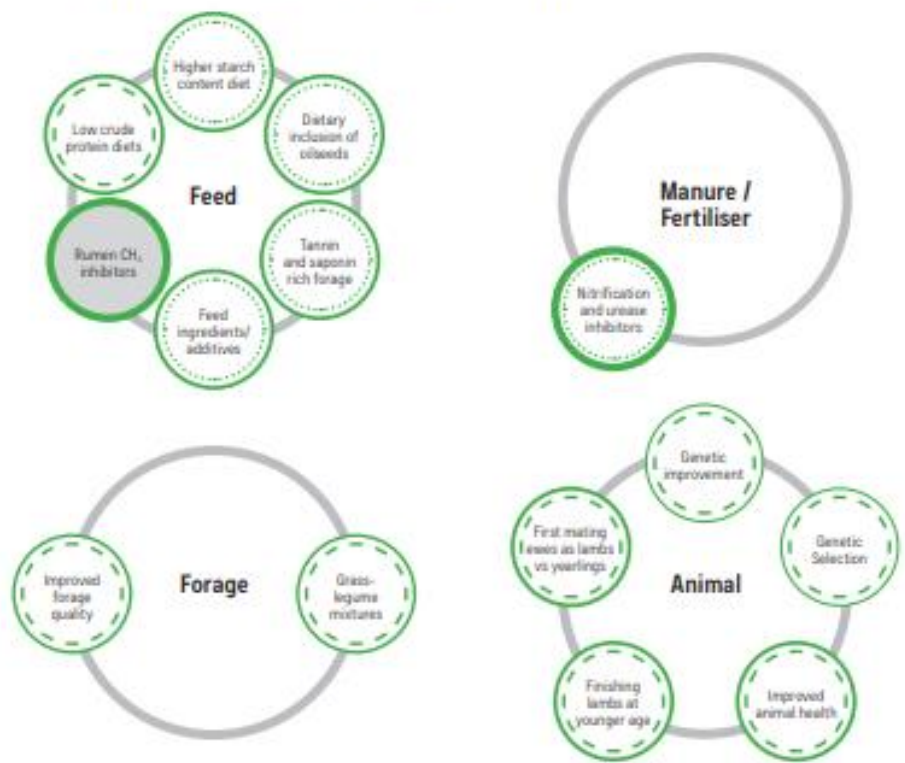
# How farmers can reduce emissions: LAMB

## Current sector snapshot

- £1.3bn – Value of UK mutton and lamb production (2020)
- Largest component of on-farm emissions from UK sheep production = Enteric CH<sub>4</sub>, then N<sub>2</sub>O (fertiliser and manure application to pasture)
- GHG emission intensity from UK sheep production influenced by farm type: Lowland systems = lower emissions

Average GHG emissions intensity of lamb –  
 Lowland = 11kg CO<sub>2</sub> - eq/kg of liveweight,  
 Upland & Hill = 13 – 18kg CO<sub>2</sub> - eq/kg of liveweight

## Potential for mitigating GHG emissions in Sheep



**Key**

Impact on Carbon Footprint: High (solid green), Medium (dashed green), Low (dotted green)

Cost: High (solid green), Medium (dashed green), Low (dotted green)

Mitigation not yet widely available: (grey circle)

Click or scan the QR code to download the full report



Table 10 Potential for mitigating GHG emissions in lamb.

Strategy	Cost	Ease of Implementation	State of readiness to implement	Potential GHG mitigating effect	Impact on carbon footprint	Inventory	Certainty	Other Impacts
<b>Feed related</b>								
Higher starch content diet	M	M	Now	CH <sub>4</sub> ↓	M	Y	H	
Increasing dietary oil and fat content, dietary inclusion of oilseeds	M	M	Now	CH <sub>4</sub> ↓	M	Y	H	
Low crude protein diets	L	M	Now	CH <sub>4</sub> ↓ N <sub>2</sub> O↓	M	Y	H	NH <sub>3</sub>
Feeding tannin- and saponin-rich forage	M	M	Now	CH <sub>4</sub> ↓	M	N	H	
<b>Feeding CH<sub>4</sub> inhibitors</b>								
3-NOP	Unknown	M	Later	CH <sub>4</sub> ↓	H	N	H	
Nitrate*	L	M	Later	CH <sub>4</sub> ↓	M	N	H	
Active compounds from seaweeds	Unknown	M	Later	CH <sub>4</sub> ↓	H	N	M	
<b>Specialised feed ingredients/additives</b>								
Grass-legume mixtures, multi-species swards	L	M	Now	CH <sub>4</sub> ↓ N <sub>2</sub> O↓	M	Y	H	B
Improved forage quality by early harvest, increasing grazing frequency, decreasing regrowth interval, etc.	L	H	Now	CH <sub>4</sub> ↓	M	Y	H	

See Section 4 of this report to support the interpretation of this table.

\*Extreme care required during incorporation to diets due to animal health concerns.

# CIEL Research: the way forward

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- 1. Farm carbon calculators:** Essential – Define standard features & reward good practice
- 2. Collaboration across sector:** Delivering change requires a collective effort
- 3. Focus on Efficiency:** Adopt mitigations that also increase profit
- 4. New technologies:** Exploit as they become available



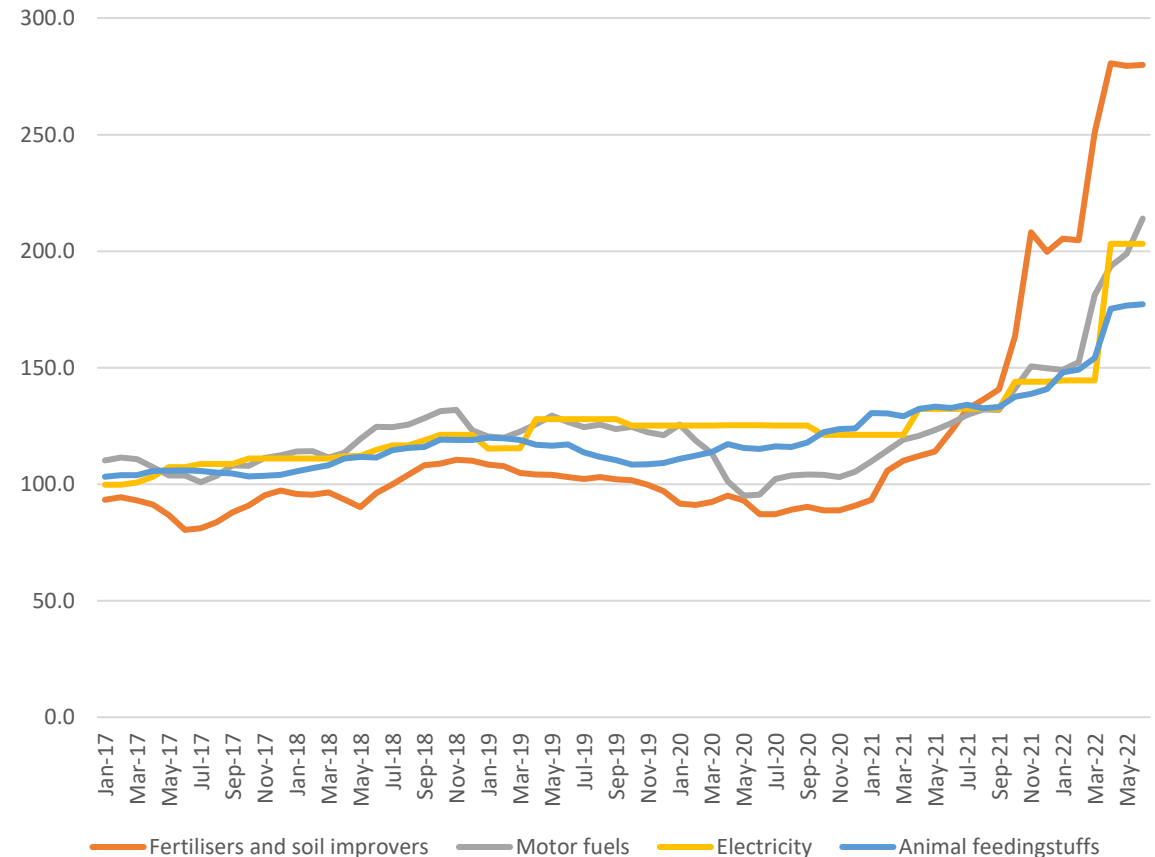


“Cost of living, spikes in the prices of inputs, food security... so many things putting pressure on farmers and food production that will mean all this sustainability stuff disappears.”



**ROYAL ASCOT FREE £2 SHOP BET** WITH William HILL SEE PAGE 26  
**DAILY EXPRESS** UNITED WITH THE PEOPLE OF UKRAINE **FRIDAY, JUNE 17, 2022** 60p  
**RECORD BAKER!** Heatwave warning as Britain set for 93F 'Fiery Friday' SEE PAGE 9  
**FREE PREMIER LEAGUE FIXTURES GUIDE** YOUR 4-PAGE PULL-OUT INSIDE THE CROWN  
**'Tough times ahead' as Bank fights to 'squeeze' inflation**  
**SHOCK AS FOOD PRICES TO SOAR 15%**  
 By Sarah O'Grady Social Affairs Correspondent  
 FOOD prices are set to rocket by 15 per cent this summer, industry leaders warn. Soaring inflation and a real fall in wages could see a family of four's typical monthly shopping bill leap from £360 to £420. One Cabinet minister warned of "tough times" ahead and Bank of England chief economist warned rates to get the squeeze on rising prices, adding hundreds of pounds.  
**THINK TO PAGE 4**  
**Kate's mission to keep kids safe** SEE PAGE 11

Price Indices: Feed, Fertiliser, Fuel & Electricity  
 Source: Defra



# Keep focusing on the Research



Dairy 



Centre for Dairy Science  
Innovation (CDSI)



Pig 



UNIVERSITY OF LEEDS

National Pig Centre

Beef and Sheep 



North Wyke Farm Platform



Poultry 



Allermuir Avian  
Innovation and Skills  
Centre (AISC)

[cielivestock.co.uk](http://cielivestock.co.uk)



# Key Contacts

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## Leadership Team

- ▶ [Lyndsay Chapman](#) Chief Executive Officer
- ▶ [Phil Bicknell](#) Head of Business Development
- ▶ [Dr Mark Young](#) Head of Innovation
- ▶ [Lyndsey Kendall](#) Head of Finance



## Membership and Business Team

- ▶ [Helen Brookes](#) Business Development Manager
- ▶ [Dr Annie Williams](#) Business Development Manager
- ▶ [Nikki Dalby](#) Business Research & Delivery Manager
- ▶ [Martin Sutcliffe](#) Aquaculture Specialist



## Research capability and Innovation

- ▶ [Dr Fiona Short](#) Innovation Manager (Nutrition)
- ▶ [Dr Harry Kamilaris](#) Innovation Manager (Sustainability)
- ▶ [Dr Grace O’Gorman](#) Animal Health Specialist

