



# **Climate change from a beef and lamb perspective**

**Chris Lloyd, EBLEX**

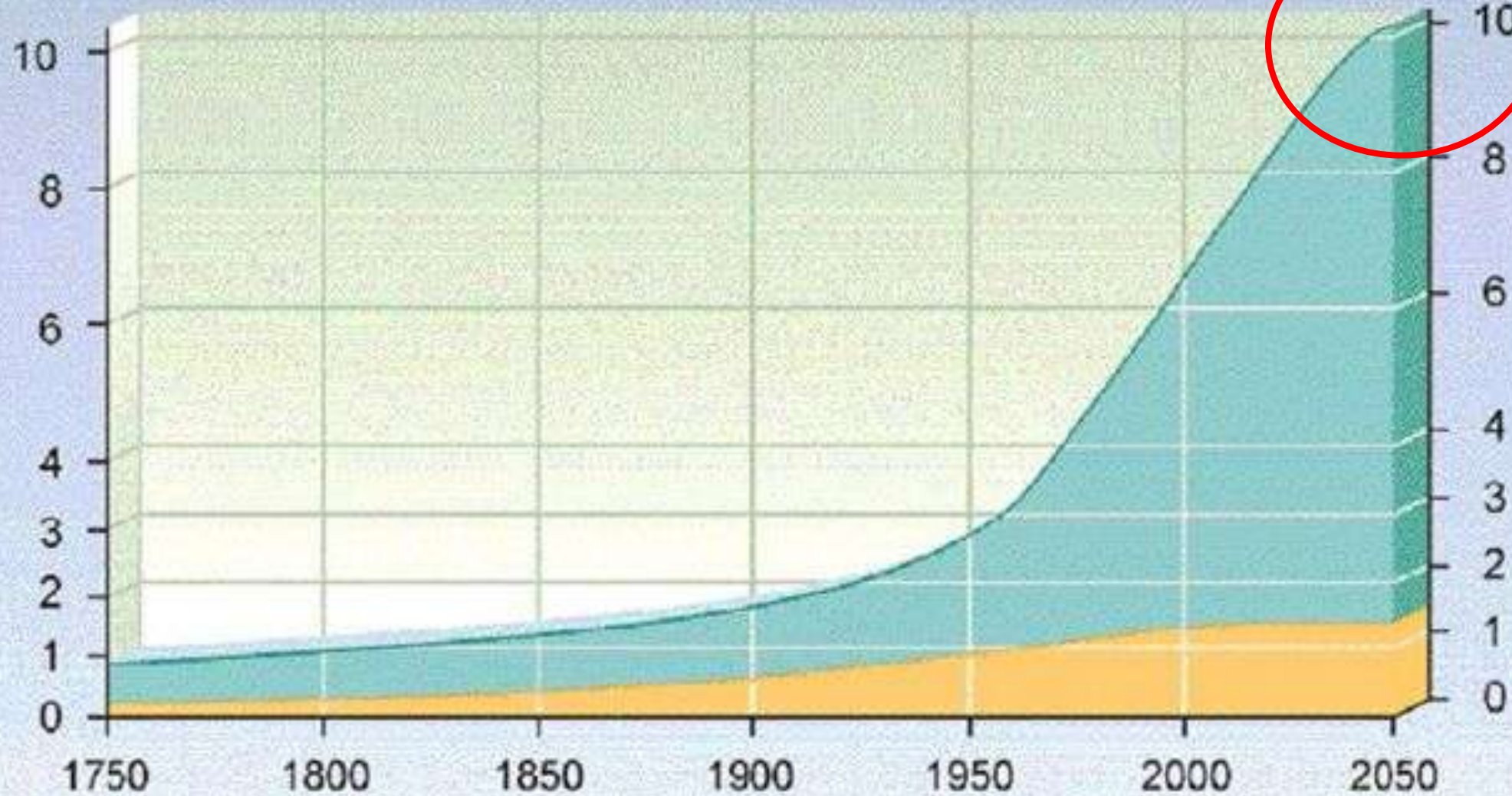


# The Challenge Ahead

- UK's Low Carbon Transition Plan calls for 18% reduction on 2008 levels of 610 millions tonnes of CO<sub>2</sub> Eq
- Farmings 2020 target is 11% reduction
- Huge area of activity in Defra and beyond
- Challenges to reduce livestock numbers

# World population development

Billions



Billions

Developing countries  
Industrialized countries

ONE MEAT-FREE DAY CAN HELP TACKLE CLIMATE CHANGE: UN

# EAT LESS MEAT, SAVE THE EARTH





change  
in the air

The English Beef and Sheep Production Roadmap - Phase 1

# EBLEX Roadmap Phase 1

2009





# GWP of Beef and Lamb Cranfield Life Cycle Analysis

	UK Beef	UK Lamb	Pork	Chicken	Potato
GWP t CO <sub>2</sub> Eq	<b>13.9</b>	<b>14.6</b>	<b>4.0</b>	<b>2.7</b>	<b>0.15</b>

Based on Deadweight



# Beef GWP<sub>100</sub> CO<sub>2</sub> eq

2008 Baseline	GWP <sub>100</sub> kg CO <sub>2</sub> eq/ kg
Lowland suckler <b>19%</b>	17.12
Hill/ Upland suckler <b>30%</b>	16.98
Dairy beef <b>51%</b>	10.97



# Sheep $GWP_{100}$ $CO_2$ eq

2008 Baseline		$GWP_{100}$ kg $CO_2$ eq/ kg
<b>Hill</b>	<b>39%</b>	<b>18.44</b>
<b>Upland</b>	<b>30%</b>	<b>16.62</b>
<b>Lowland</b>	<b>31%</b>	<b>13.82</b>

EBLEX 2009





2010



# EBLEX Roadmap Phase 2

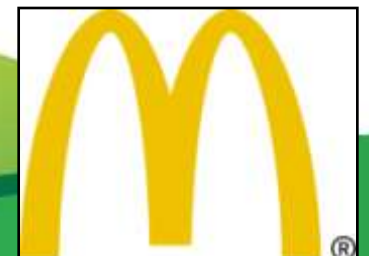
- On farm CO<sub>2</sub> audits
- Water Footprints
- Processing CO<sub>2</sub>
- Non food benefits of livestock.





# Production footprints

- Surveyed 60 English farms using ECO<sub>2</sub> model
- Received 67 extra beef farms from McDonalds
- Findings.....



# Beef Production footprints



kg CO<sub>2</sub>eq/ kg LW Beef

- Overall kg CO<sub>2</sub>eq/kg LW

- Top Third 6.2
- Average 11.9
- Bottom Third 19.1

Highest 26.9  
Lowest 3.2

	Upland Suckler	Lowland suckler	Dairy Beef	Bull Beef
Averages	15.7 (15.7)	19.2	11.8 (10)	10.6

Surveyed 30 English farms using ECO2 model (MacDonald's Data)

# Beef CO<sub>2</sub> v ££'s



30,000

25,000

Every 5kg of CO<sub>2</sub> reduction /kg LW  
= 50p /kg increase in £ margin

CO<sub>2</sub>

10,000

5,000

0

0

5

10

15

20

25

30

Gross margin p/kg LW

# Sheep Production Footprints



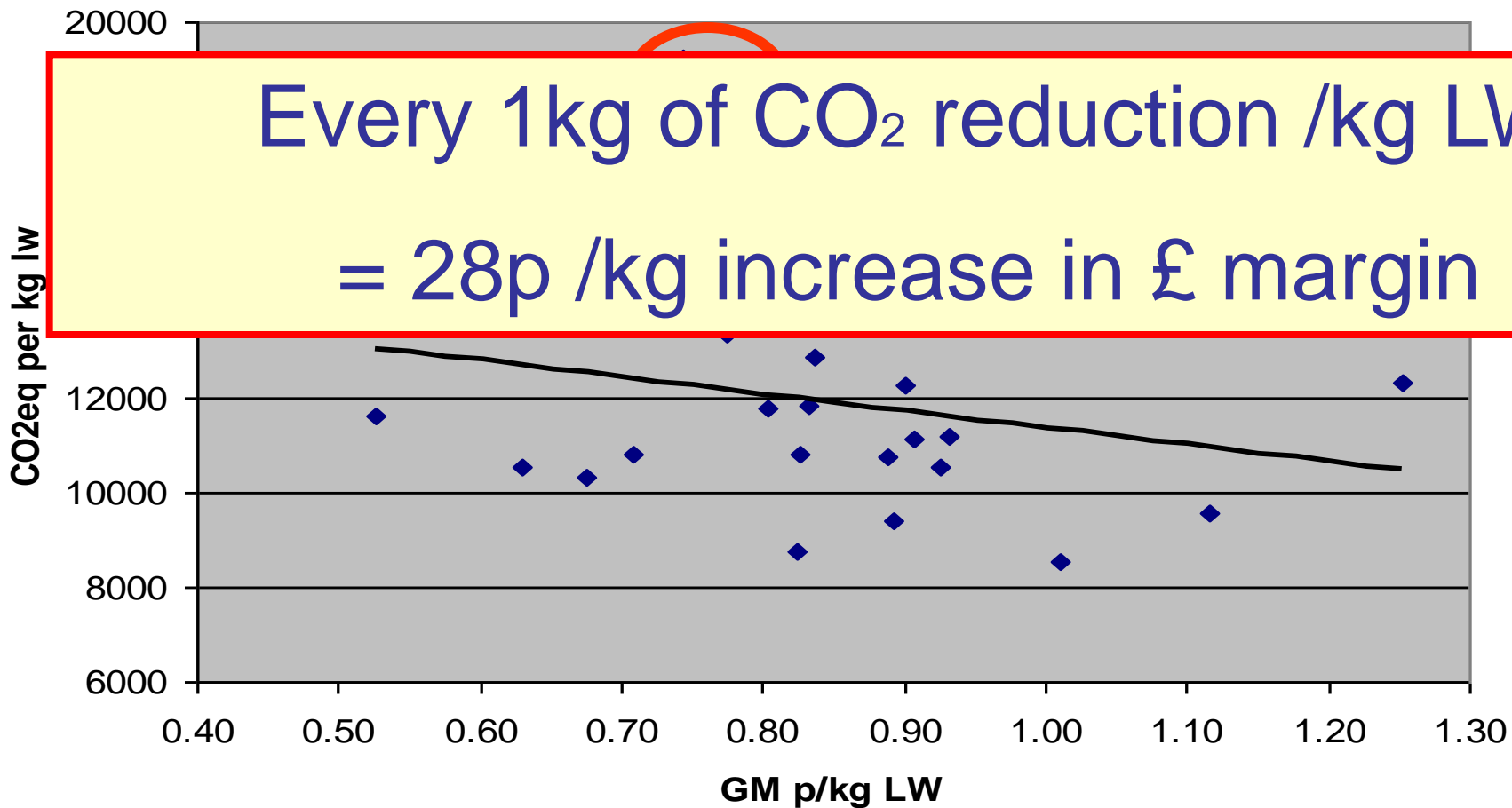
- Overall **kg CO<sub>2</sub>eq/ kg LW Lamb**

– Top Third	9.8	Highest	19.2
– Average	11.9		
– Bottom Third	14.6		

	Hill	Upland	Lowland
Averages	<b>13.6</b>	<b>11.0</b>	<b>11.1</b>

- Surveyed 30 farms in England using ECO2 model

# Sheep CO<sub>2</sub> v ££'s



# Water and Energy Use in Meat Processing Sector



Water and Energy use per kg of meat

	<b>Water</b>	<b>Energy</b>	<b>Kg CO<sub>2</sub></b>	<b>Effluent Discharges</b>
Beef	3.6litres	0.63kWh	0.27	3.1litres
Lamb	2.5litres	0.54kWh	0.23	2.1litres

Total Meat Industry Water Use 7.2m litres

Soft Drinks Industry

27.5m litres

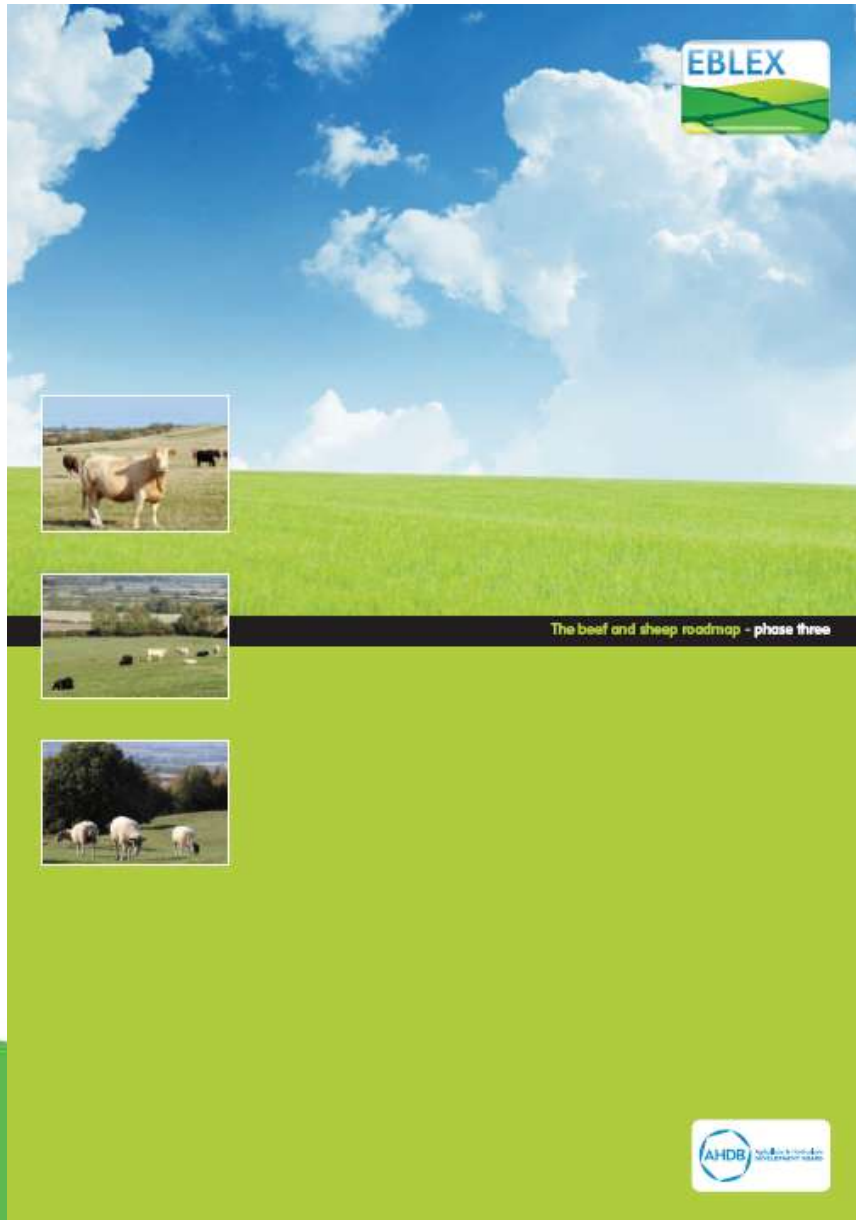
source Defra



2011

# EBLEX Roadmap Phase 3

- On farm CO2 audits
- Low carbon case studies
- Retailer mitigation activity
- Sequestration review
- Supply chain waste project





# 2011 Beef Footprints



<b>Beef farm footprints</b> 131 units in total	<b>2011kg CO2e/ kg lw</b>	<b>2010 kg CO2e/ kg lw</b>
Average	12.2	11.9
Lowest	3.0	3.2
Highest	29.7	26.9

Includes data kindly supplied by MacDonaldis from their own EC02 survey.



# 2011 Beef Footprints



System type	Average beef (kg CO <sub>2</sub> e/ kg lw)	Average stores figure (kg CO <sub>2</sub> e/ kg lw)
Dairy beef	8.6	-
Finisher	10.5	-
Rearer finisher	15.2	-
Lowland producer taking calves to store	-	15.7
Upland producer taking calves to store	-	13.4





# 2011 Sheep Foot Prints

57 Sheep farms selling finished animals)	kg CO <sub>2</sub> e/ kg lw	kg CO <sub>2</sub> e/ kg dw
Average	11.86	25.79
Lowest	6.43	13.98
Highest	19.71	42.85



# 2011 Sheep Foot Prints

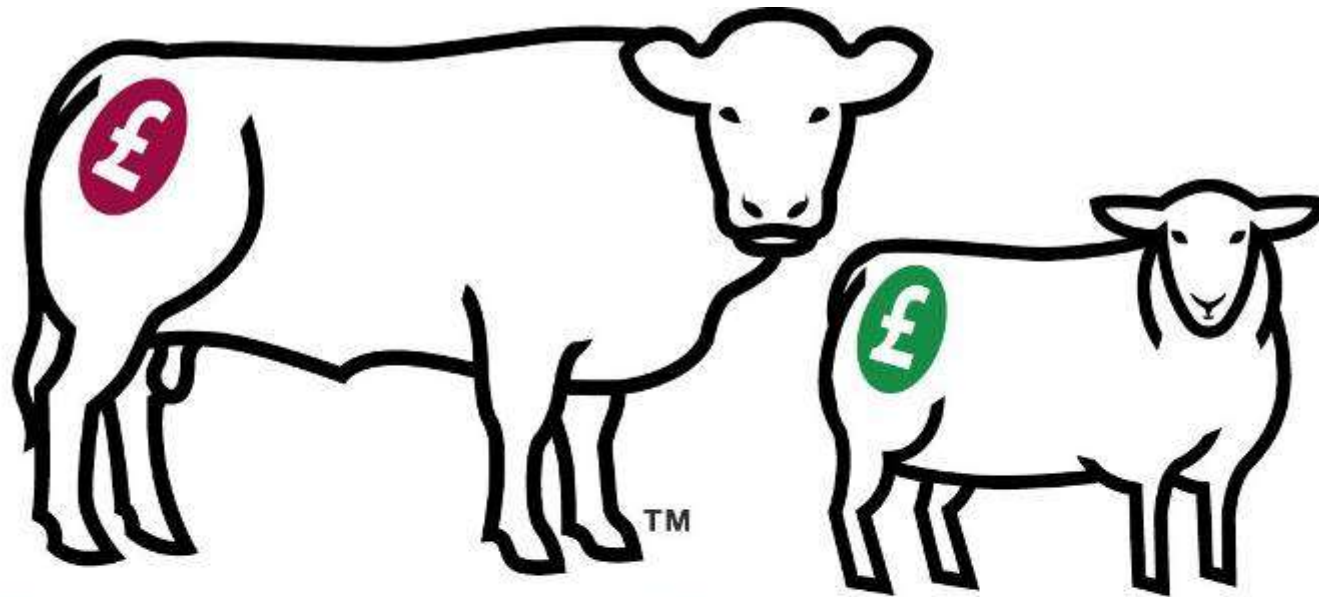
System type	Average finished (kg CO <sub>2</sub> e/ kg lw)	Range (kg CO <sub>2</sub> e/ kg lw)
Lowland sheep farms (31 farms)	10.98	6.43 - 17.78
Upland sheep farms (11 farms)	10.86	8.97 - 15.35
Hill farms (15 farms)	14.42	8.42 - 19.71



**We know how to improve!!**

- 1. Increase feed efficiency**
- 2. Increase fertility**
- 3. Increase longevity**

**WIN WIN... this will also improve margins!**



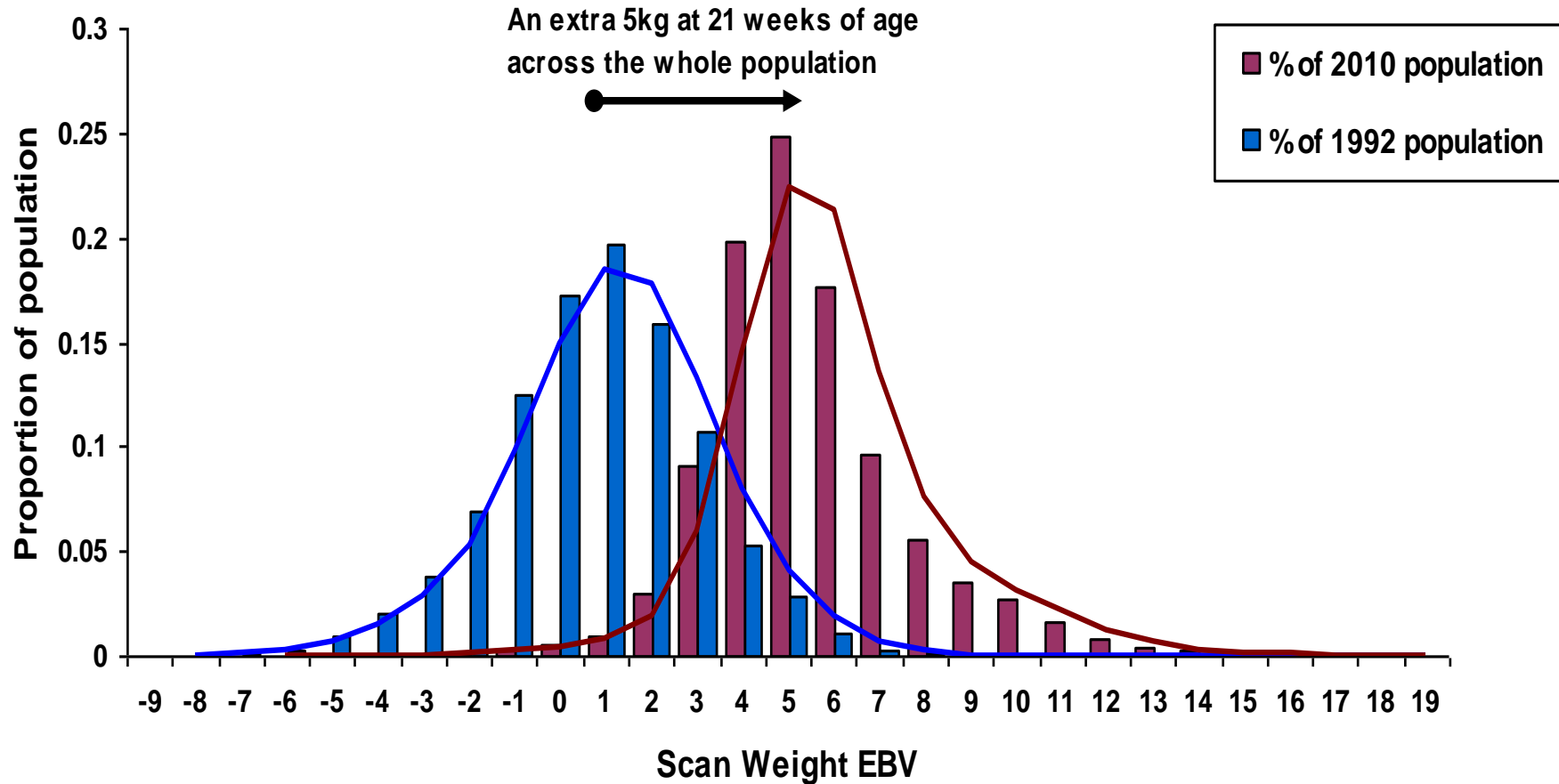
# Better Returns Programme



# Improving efficiency

- Reduce calving period
- Improve pasture management and utilisation
- Reduce lamb and calf mortality
- Use best genetics, use EBV's for selection
- Increase cow and ewe longevity

# Distribution of Scan Weight EBVs in British Texel Sheep



Proportion of lambs with Scan Weight EBV over 5kg in 1992 = 4%

Proportion of lambs with Scan Weight EBV over 5kg in 2010 = 67%





# Conclusions

- The relationship between food supply, resource use, biodiversity, landscape and water is complex.
- Measuring the livestock industry on CO<sub>2</sub> alone is too simplistic
- Food supply demands mean addressing GHG issues proactively for years to come
- We are improving our understanding of CO<sub>2</sub> drivers which will help target future work.
- Improved economic performance goes hand in hand with lower CO<sub>2</sub> eq costs of production

# Conclusions 2



- Cattle and sheep produce valuable products for human consumption but at a GHG “cost”
- We can reduce GHG cost considerably if we apply what we know
- Large areas of the UK cannot reasonably produce food for people without cattle or sheep
- Unless consumer behaviour changes reducing production at home will simply export the problem

# Conclusions 3



- Industry has to OWN this issue.
- We can and should make a contribution to reducing the C footprint of production
- We should robustly defend the role of ruminants in food production, soil management as a carbon sink, habitat management and landscape management.



Thank You

# Water Footprint

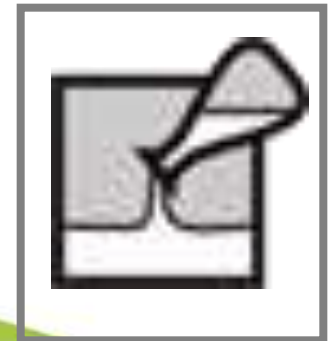
**Blue water** - From a pipe



**Green Water** - Rainfall



**Grey Water** - To dilute pollutants to acceptable levels



Calculations by Cranfield University using LCA industry structure



# Water use in English Beef Production

litres of water per kg of carcase

	<b>Blue Water</b>	<b>Green Water</b>	<b>Grey Water</b>	<b>Total</b>
Lowland suckler	78	15,600	3,490	19,168
Hill Suckler	103	44,200	3,080	47,383
Dairy beef	45	8,150	1,980	10,175

# Water use in English Sheep Production



litres of water per kg of carcasse

	<b>Blue Water</b>	<b>Green Water</b>	<b>Grey Water</b>	<b>Total</b>
Lowland	31	21,800	2,550	24,381
Upland	40	24,700	2,600	27,340
Hill	85	135,000	205	135,290
Average	49	55,800	1,910	57,759