

# Trees and Livestock :

# A balancing act

What are the challenges / opportunities for balancing trees and livestock in the North of England?



Write your questions / thoughts on a leaf and add it to the tree 😊



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# Trees and livestock :

# A balancing act

- Lindsay Whistance, Senior Livestock Researcher, Organic Research Centre
- Paul Muto, Woodland and Tree Officer, North Pennines National Landscape
- Rick Cooper, Low Skelgill Farm, Cumbria



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# REFOREST North of England Living Lab



- Network of farmers, researchers and advisors sharing knowledge and experience with agroforestry
- Workshops, farm visits, study trips and newsletter
- Opportunity to connect with local and international farmer



**Animals and Trees**

**A balancing act**



**Dr Lindsay Whistance**

A photograph of a pig farm in a natural setting. In the background, there is a large, arched shelter made of blue corrugated metal. Several pigs are visible: one is partially hidden behind a tree on the left, another is near the shelter's entrance, and two others are in the foreground, one of which is eating from a green bush. The scene is filled with trees and lush green vegetation, suggesting a natural and shaded environment.

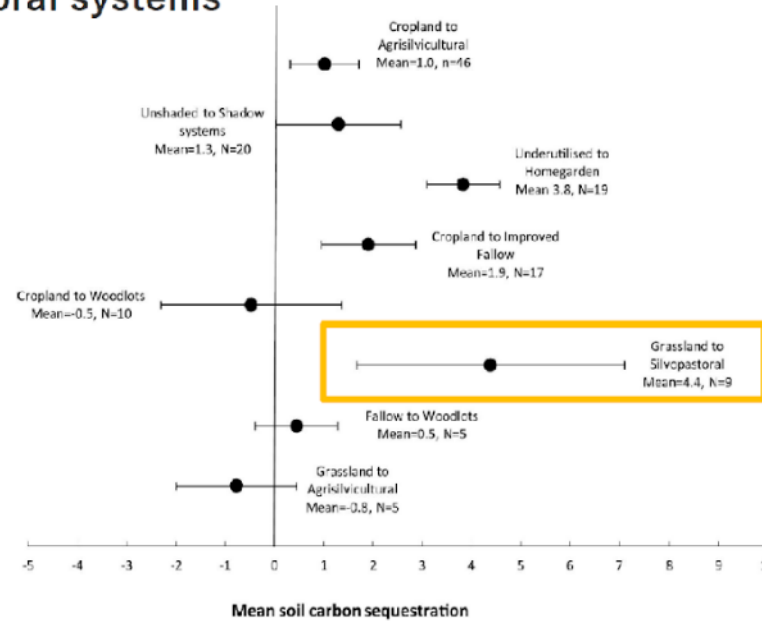
Homeostatic equilibrium  
balance

Physiological health  
Emotional health  
Natural behaviour

Animal welfare



# Soil carbon sequestration rates ( $t\ C\ ha^{-1}\ yr^{-1}$ ) are higher in silvopastoral systems



Carmen Segura Quirante slide

Feliciano et al. (2018)



Wiltshire, summer 2018

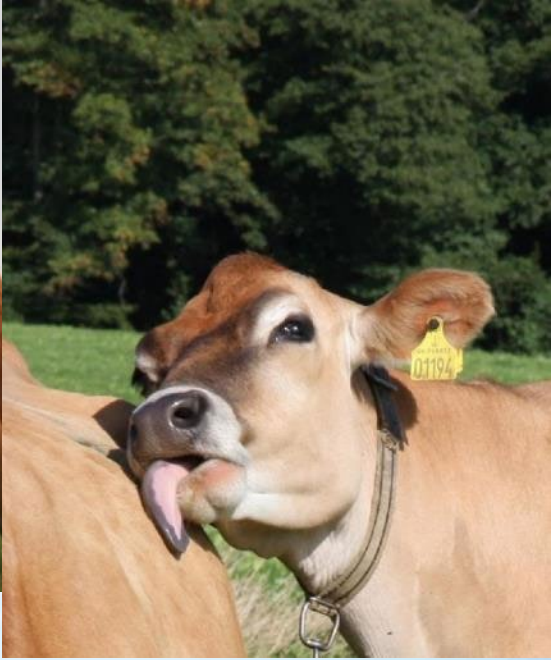


Andrew Barbour



**Resilient Systems**

Jim McAdam



Social relationships



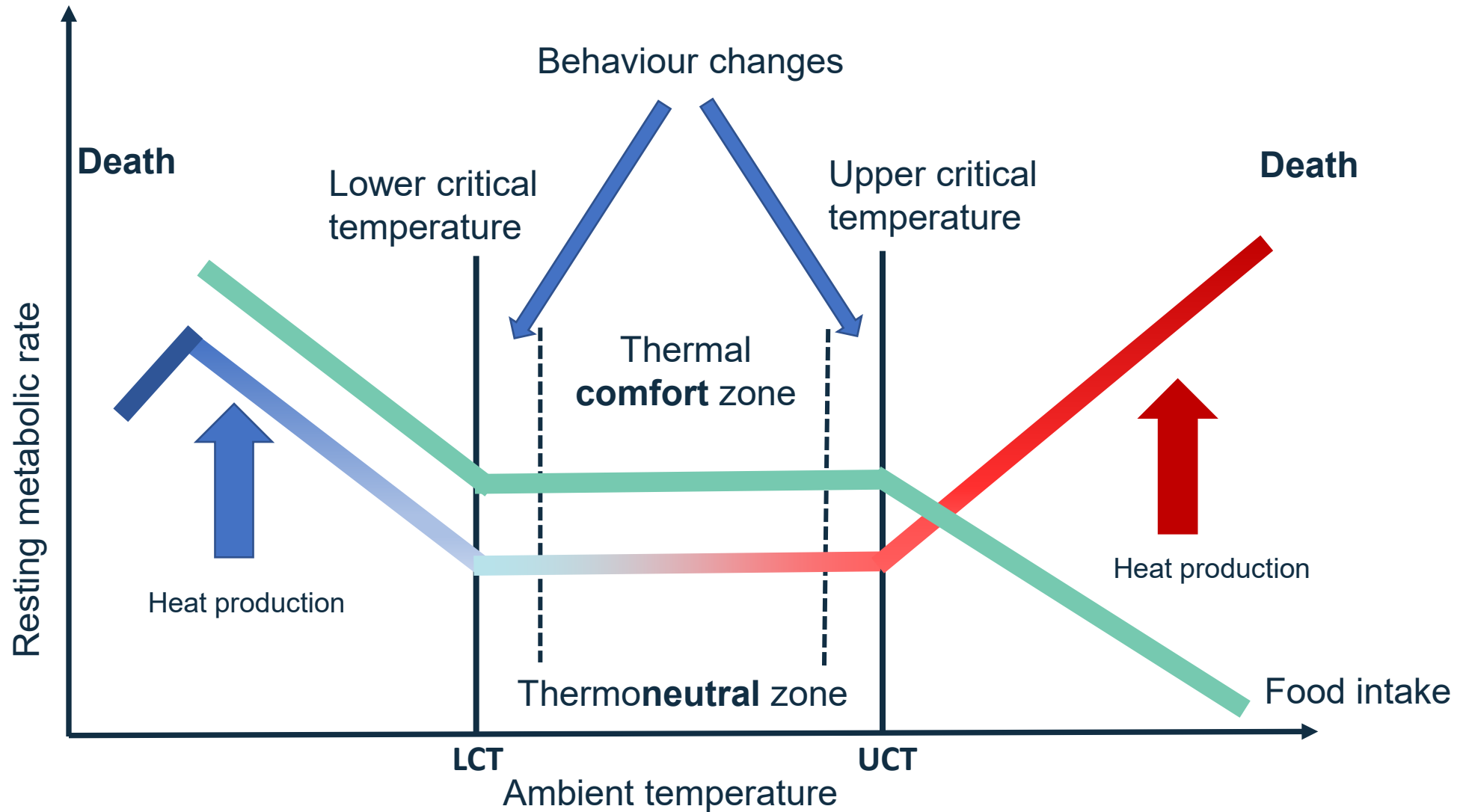
## Body care





# Thermoneutral zone

Where metabolic rates are low/minimal





**Systems with valid choices for good welfare**

For every 1°C drop in temperature below an animal's LCT:  
Beef: a 2% increase in energy requirements is needed and  
Newly shorn sheep: a 1.7% increase is needed.



Same rain storm with and without shelter



# Cold stress



(Ralph, 1981)

## LAMB MORTALITY (%)

**SHELTER**

**NO SHELTER**

**Single births**

8.9

17.5

**Multiple births**

38.8

51.3

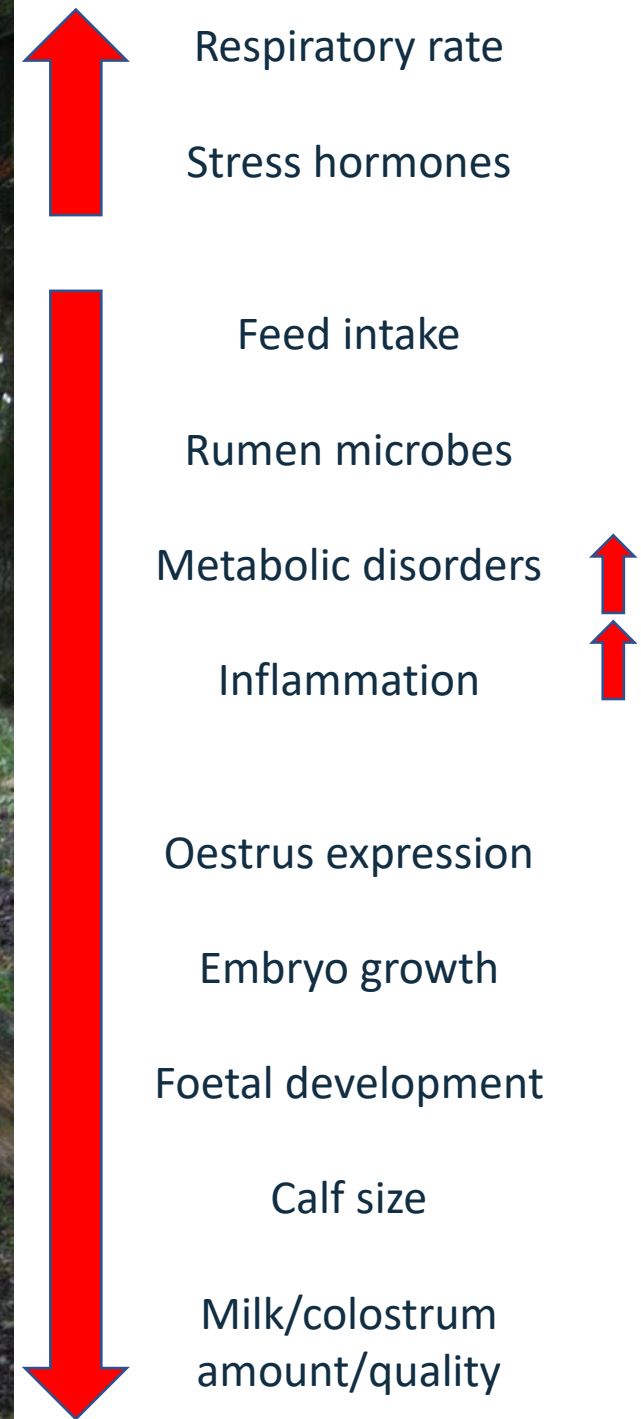




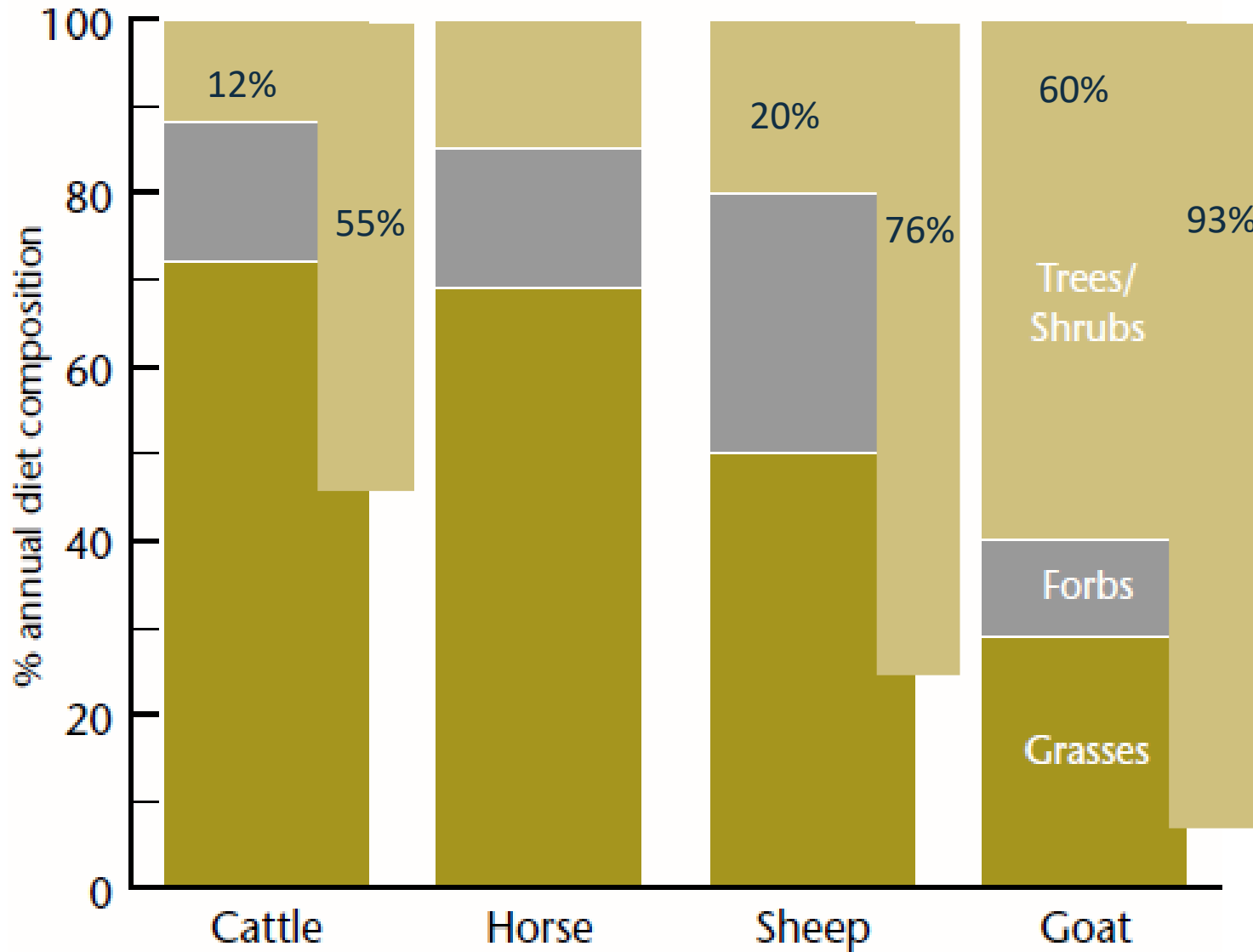
**Heat Stress**



# Negative outcomes of heat stress



# Variation in the diet of domestic stock



<http://www.forestry.gov.uk>; Dicko and Sikena, 1992



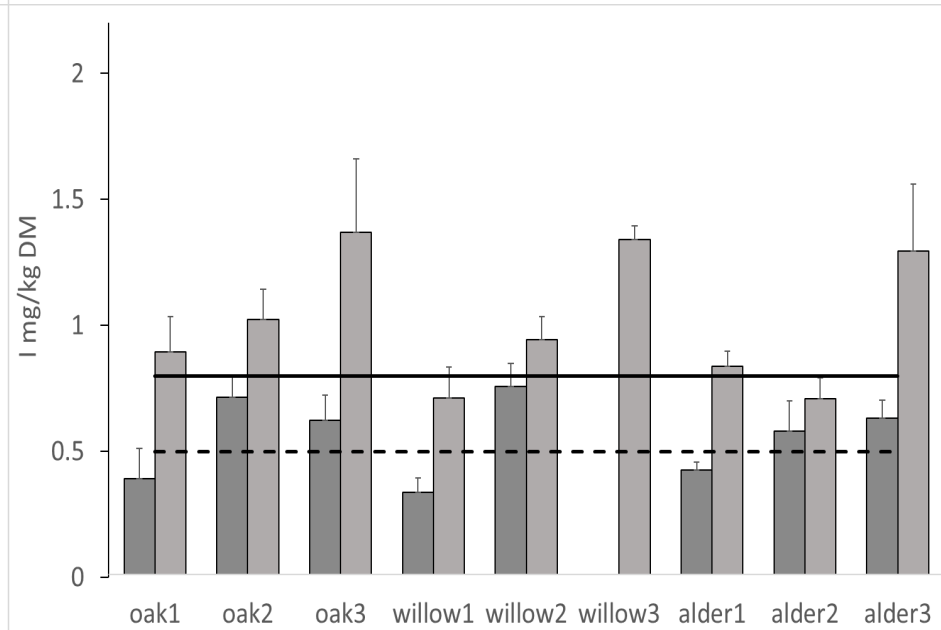
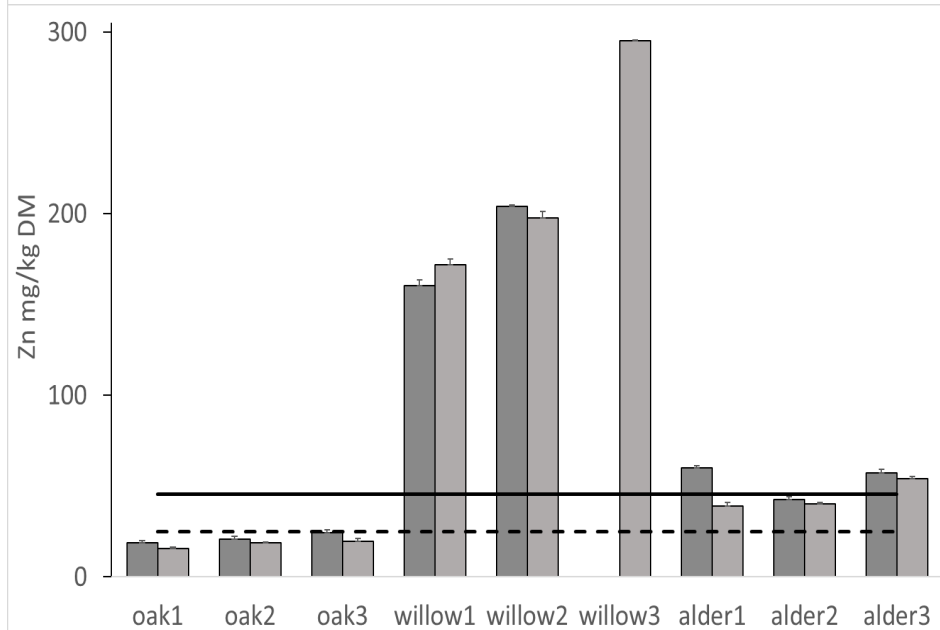
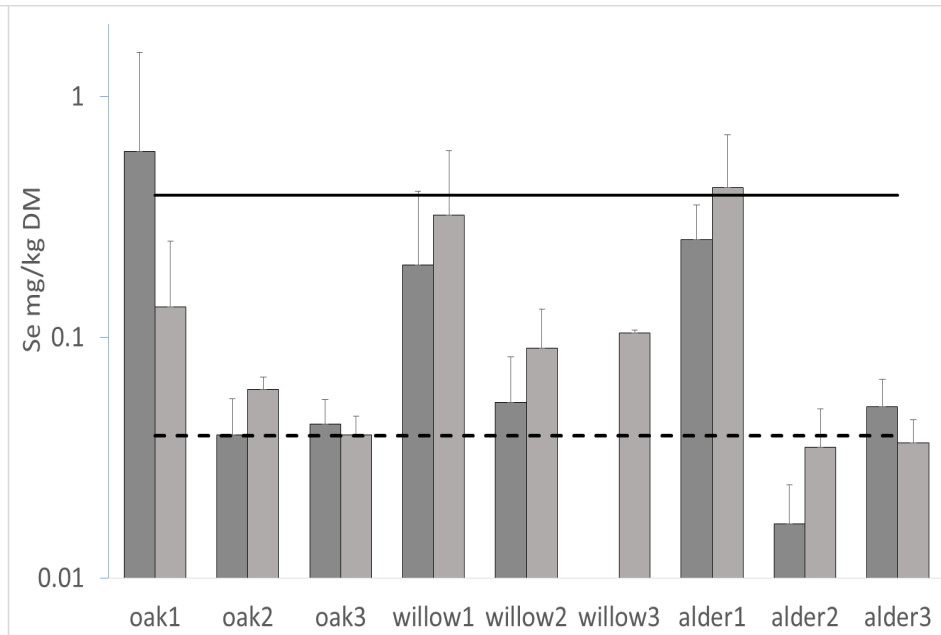
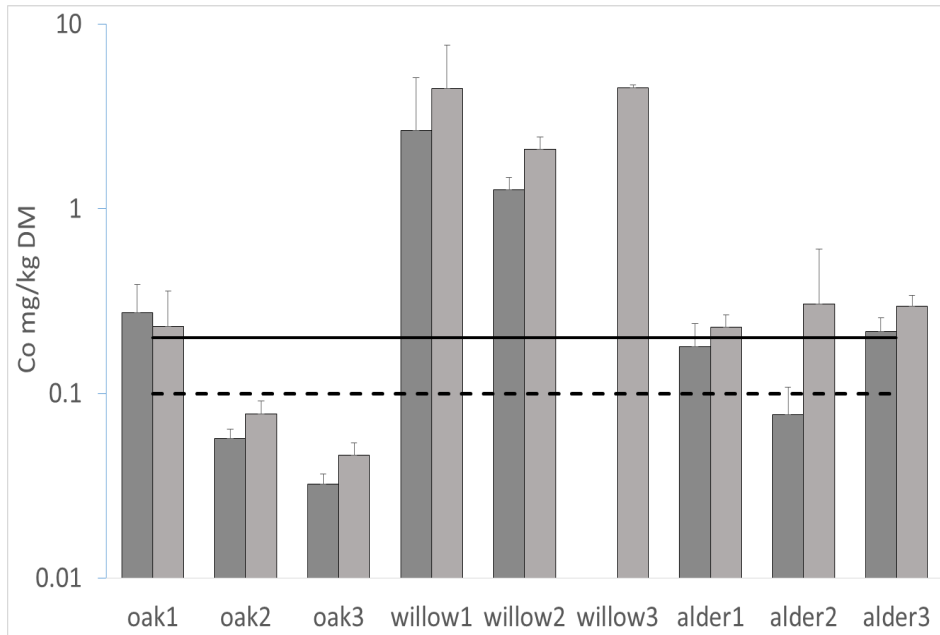
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**Leaf nutrition in tree species compared to hay and red clover (%). In: Birks et al, 1989.**

<b>Tree species</b>	<b>Moisture</b>	<b>Ash</b>	<b>Fat</b>	<b>Sugar</b>	<b>Protein</b>	<b>Fibre</b>
Wych elm	12.6	9.9	2.9	49.2	13.2	12.3
Rowan	11.9	5.9	6.5	50.4	9.9	15.4
Goat willow	11.5	6.1	3.8	50.3	11.6	16.7
Aspen	10.8	8.5	6	43.5	13.3	20.9
Ash	11.6	6.3	3	50.4	12	16.7
Grey alder	11.9	3.9	5.9	43.6	17.6	17.4
Birch	11.7	3.9	7	49.2	12	16.2
Meadow hay	14.96	5.42	2.2	44.43	8.51	24.56
Red clover	15.65	5.17	1.88	36.76	10.98	28.56

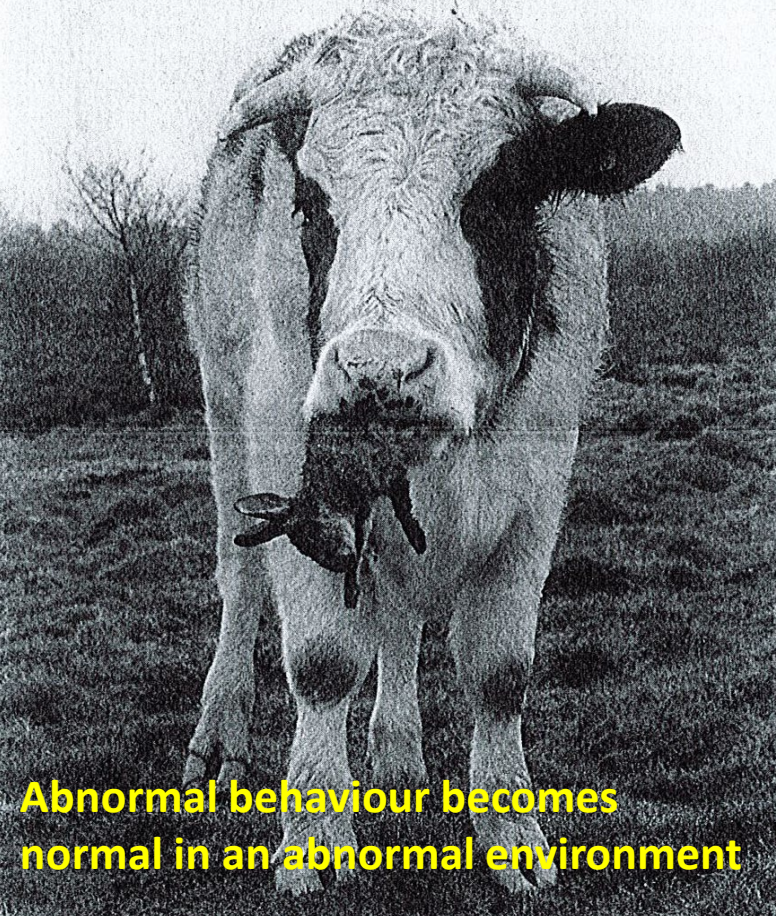




**Selected minerals**  
Sheep requirements:

— Upper range

- - - Lower range



Abnormal behaviour becomes normal in an abnormal environment



**Salicin content in willow**

<u>Scientific name</u>	<u>Common Name</u>	<u>Salicylic Acid (mg/g FW)</u>
<i>S. daphnoides</i>	European violet willow	3.21
<i>S. caprea</i>	Goat Willow	1.95
<i>S. fragilis</i>	Crack willow	1.65
<i>S. viminalis</i>	Osier willow	0.21
<i>S. alba</i>	White Willow	0.2





# 'A high quality of life for farm animals requires provision rather than deprivation'

Sommerville and Jones (2013)



Thanks for listening

# Heart of the Pennines Forest



**North  
Pennines**  
National  
Landscape



**unesco**

North Pennines  
Global Geopark

- **Target Areas**

- Covers most of the North Pennines National Landscape except for parts of Northumberland, which is covered by the Great Northumberland Forest
- Field Officers – Simon O’Hare (Cumbria), Paul Muto (County Durham)



North Pennines National Landscape



# •Funding

- Farming in Protected Landscapes (FIPL) - projects that deliver for People, Place, Climate or Nature
- England Woodland Creation Offer (EWCO) – up to £10,200 per hectare
- Countryside Stewardship (CS) and Sustainable Farming Incentive (SFI)



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# Chew the cud! Balancing trees and livestock

Questions?

Challenges

Thoughts





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Thank You!



Join the North of England Living Lab!

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