



Sektion für Landwirtschaft  
Section for Agriculture  
Section d'Agriculture  
Sección de Agricultura

# **Animals, Health and Resilience**

Our responsibility for the land and the diverse role of the animals

**Deepen Biodynamics**  
**4th – 25th September 2023**

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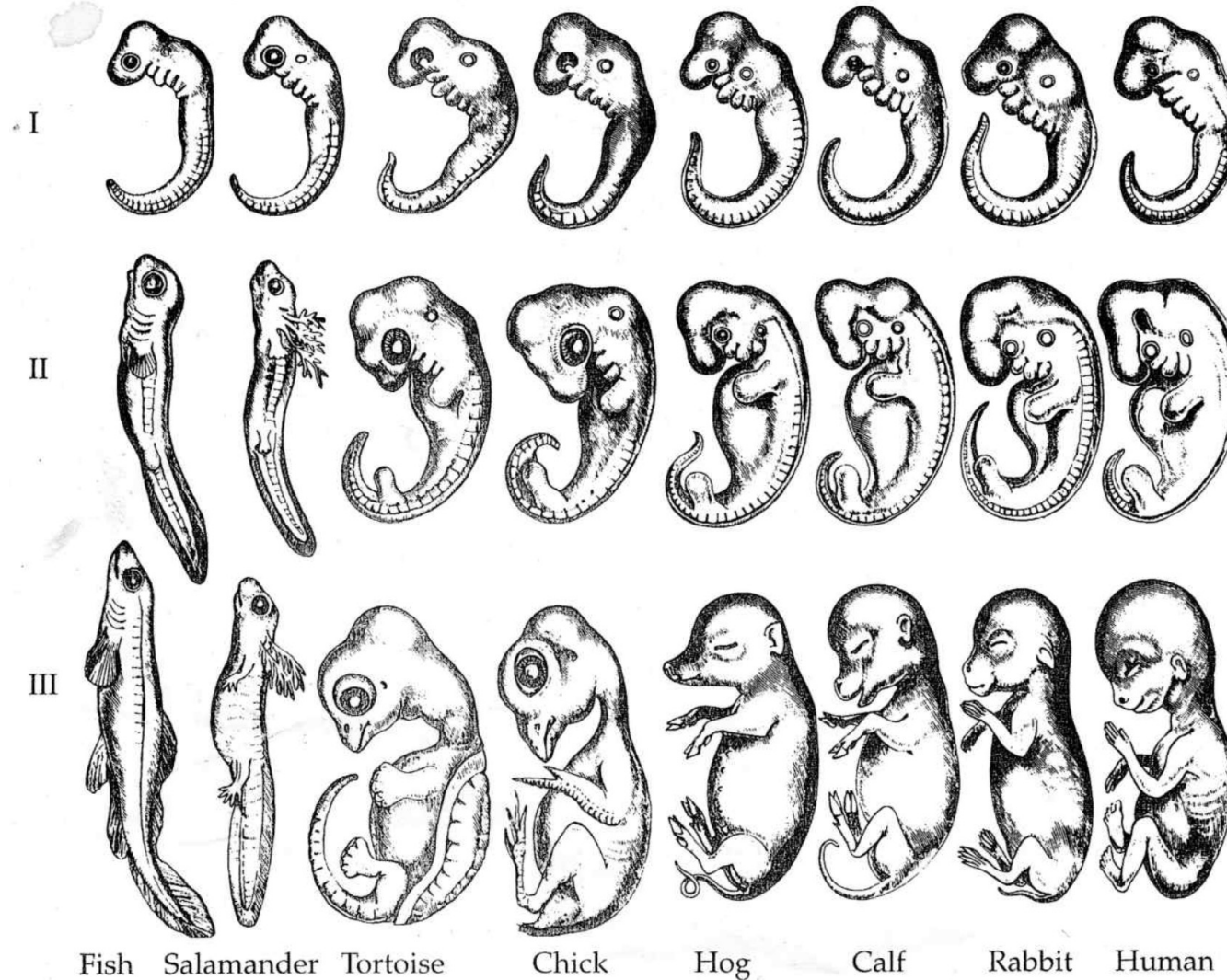
## Reflections on the Exercise



# What is so special about ruminants?

Alysoun Bolger





Comparitive embryology - vertebrates



# Ungulates – odd toed

(Hoofed animals)

## Horse

Single hoof  
Full set of teeth  
Simple digestion  
Alert/nervous  
Gestation 11 months  
grain as well as grass

## Tapir

Three toes  
Full set of teeth  
Simple digestion  
Sensitive nose  
Gestation 13 months  
Herbivores  
Spots and stripes in young

## Rhino

Three toes  
Lacking canines  
Complex digestion  
Horns (one or two) – central  
Gestation 16 months  
Feed on tough plants



# Ungulates – even toed



Pigs/Boar (wild & domesticated)

Two toes

Full set of teeth

Simple digestion

Gestation 115 days

(3 months, 3 weeks)

Spots and stripes





# Ungulates - even toed - Ruminants

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horned

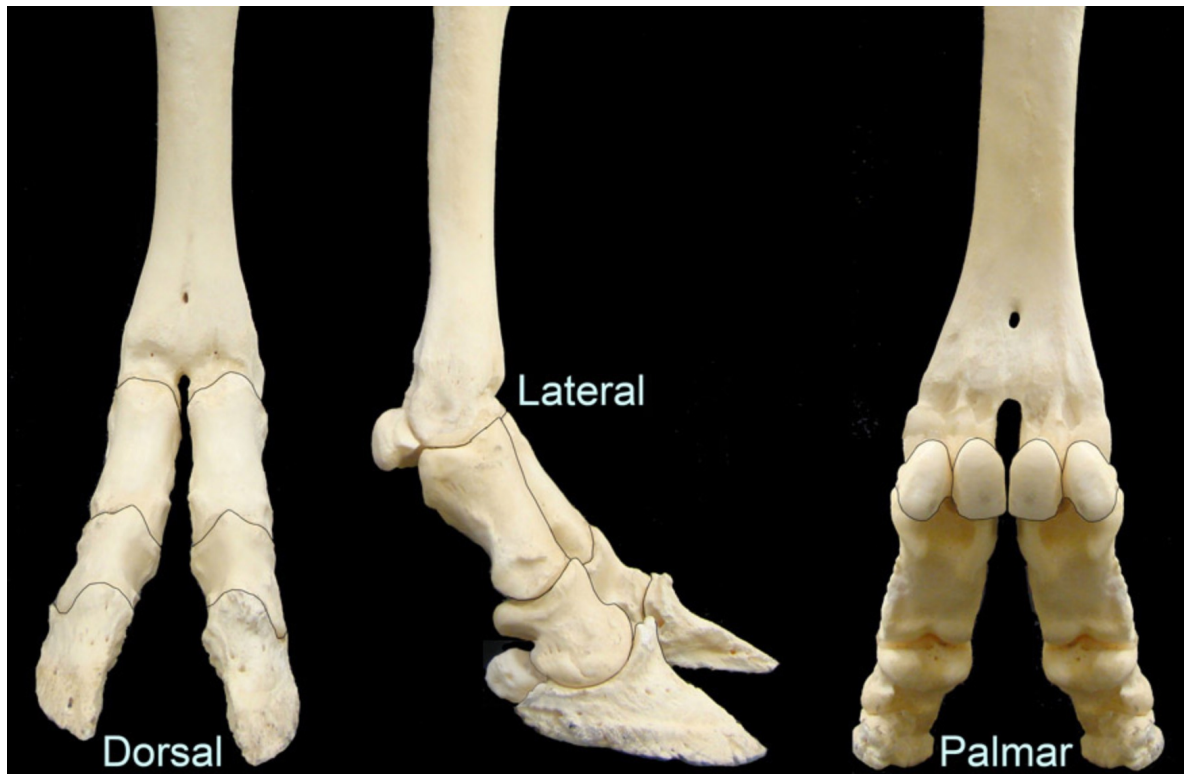


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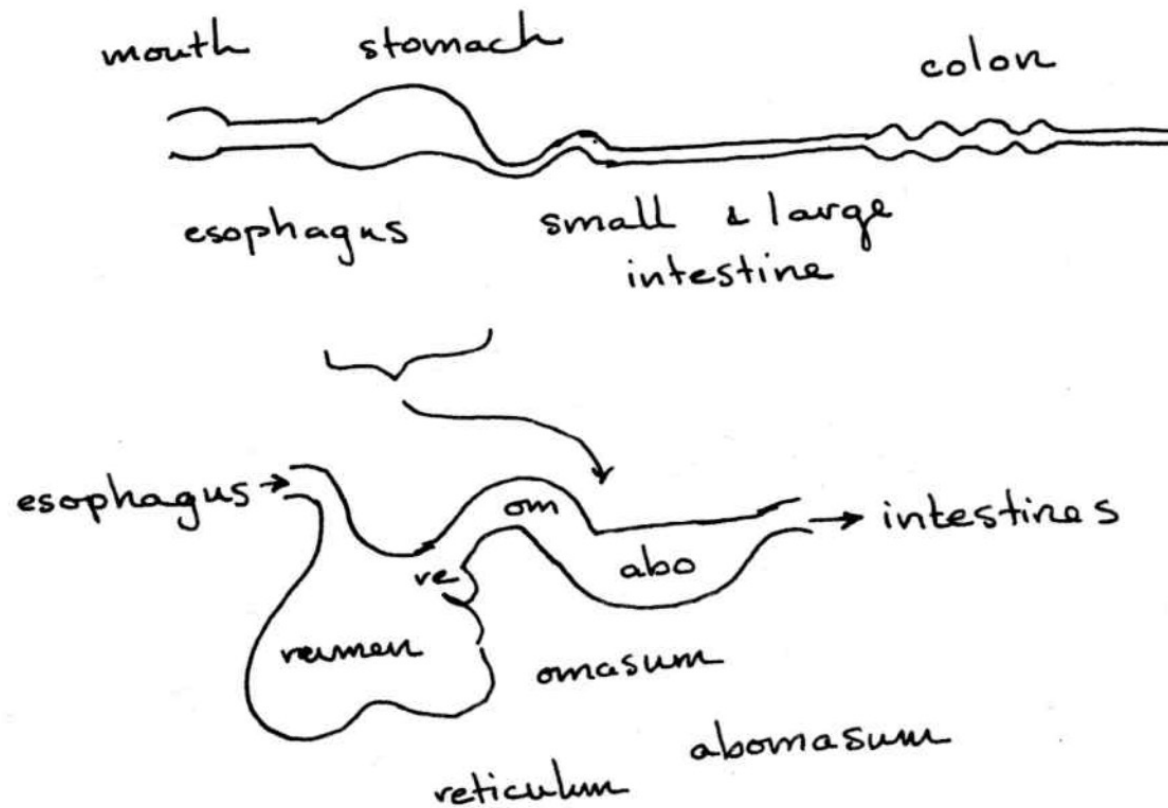
# Ungulate (toes)

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# Ungulate – Ruminant (stomach)

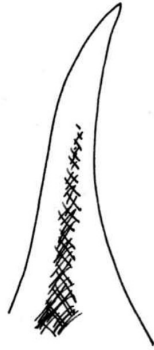
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# Horns & Antlers (heads)

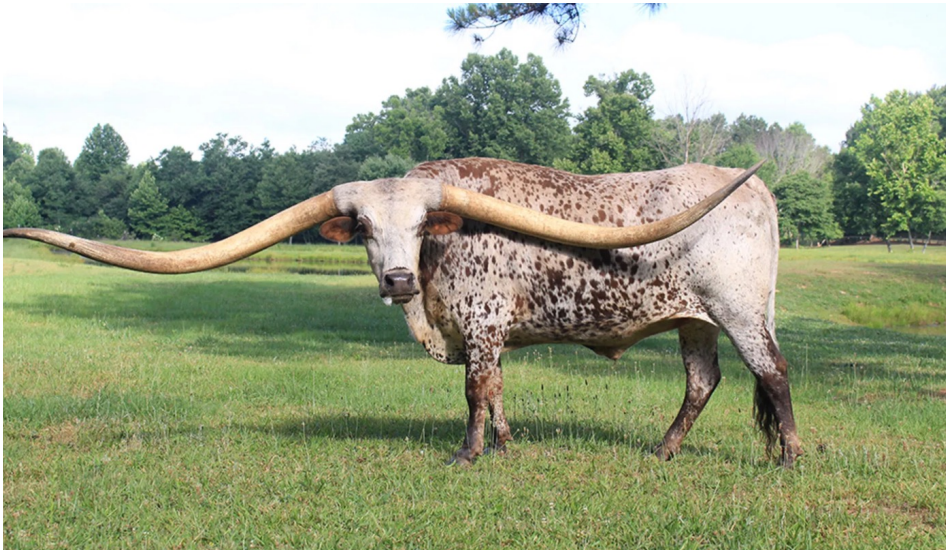
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# Horns

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# Cows

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# Elements

Human

Animal

Plant

Soil



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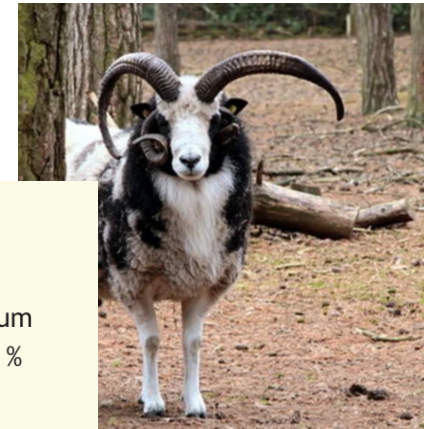
Warmth

Air

Water

Earth





NPK Values of Animal Manures			
	N Nitrogen %	P Phosphorus %	K Potassium (Potash) %
Cow Manure	0.6	0.4	0.5
Horse Manure	0.7	0.3	0.6
Pig Manure	0.8	0.7	0.5
Chicken Manure	1.1	0.8	0.5
Sheep Manure	0.7	0.3	0.9
Rabbit Manure	2.4	1.4	0.6





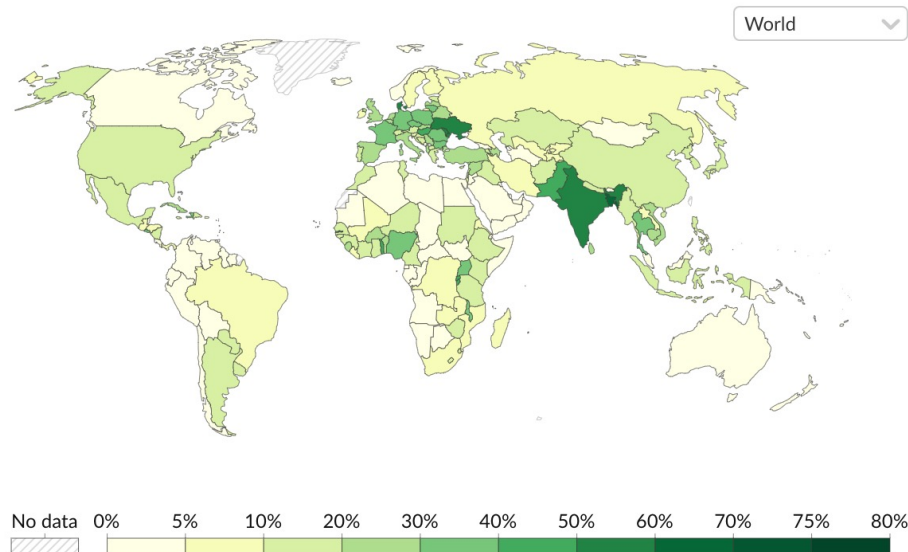
# Why animals?

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## Share of land area used for arable agriculture, 2020

The share of land area used for arable agriculture, measured as a percentage of total land area. Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow.

Our World  
in Data

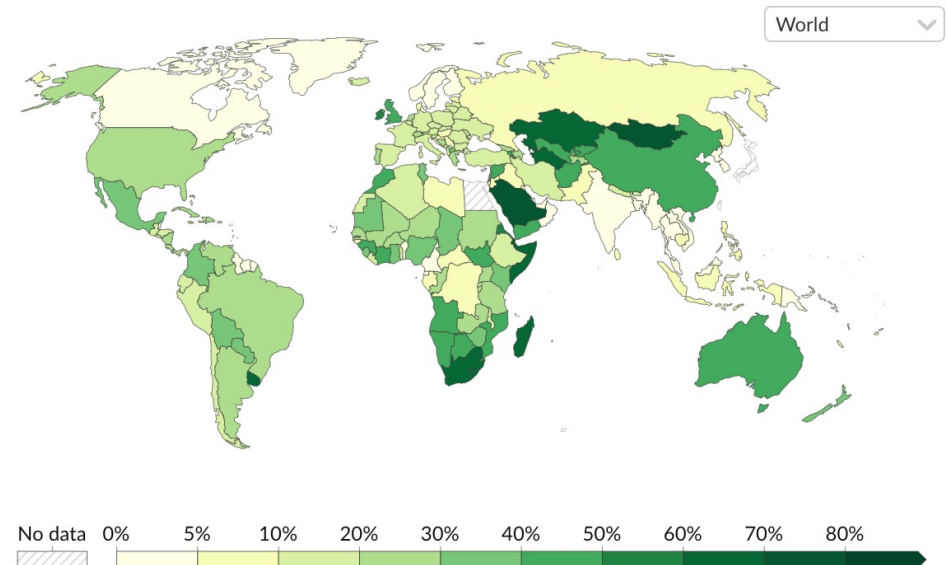


Source: Food and Agriculture Organization of the United Nations (via World Bank)  
OurWorldInData.org/land-use • CC BY

## Share of land used for permanent meadows and pastures, 2020

Permanent meadows and pastures is defined by the FAO as: "the land used permanently (five years or more) to grow herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land)."

Our World  
in Data



Source: Food and Agriculture Organization of the United Nations  
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# Culture

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Prithvi Mata

Culture in food as well

Hathor



# Domestication

- Hunting - 1.5 million years ago
- Domestication - 10,000 years ago
- Animals were valuable (fertiliser, wool, skin, eggs, milk, waste)
- We have changed each other...
- What do we do now?



## Break out session

**We have domesticated animals, changing their relationship to nature. How do you see our responsibility towards domesticated animals?**



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Break





# Domestication and Responsibility

Alysoun Bolger

# Five freedoms

- freedom from hunger and thirst
- freedom from discomfort
- freedom from pain, injury, and disease
- freedom to express normal and natural behaviour
- freedom from fear and distress.

Humane Society and UK Law

# Valuing Animals

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Black Ogye Chicken, South Korea

Eggs, meat, medicine, feathers etc.



# Choosing Animals



Dexter



Nguni



# Taking responsibility

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# Methane

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## Context

Pasture  
Biodiversity  
Fertility  
Ecosystems



# Introduction to Homework Exercise

**Soil Exercise (see library) and reading**