



The Psychology of the Ewe

Lambex²⁰¹⁰

Graeme Martin,

Penny Hawken and Dominique Blache



THE UNIVERSITY OF
WESTERN AUSTRALIA

UWA Institute of
Agriculture

Why study sheep psychology!?
Who cares!?

Answers:

- 1) Its interesting!
- 2) Market context



Animal Products



Our society is
changing ...



The Future of Sheepmeat

Clean

Hormones
Drugs
X

Green

Damage to
environment
X

Ethical

Animal
welfare **✓**

“Quality” criteria, alongside tenderness etc

Fail to adopt = Risk high-price, profitable markets

This talk: focus on **Ethical**, a bit of **Clean**

- To be **Ethical**: need sheep psychology
- Our experience of sheep psychology?

A bit negative ... but maybe we are wrong ...

Ewe psychology – Why you should care

‘Modern’ Sheep Management: We **force** them to do what we want:

1) To move them in a certain direction, we use ...

- Trained Predators (sometimes not so well trained!)
- Noisy motorbikes
- Angry humans

Stressful for us ... even more for the sheep!

Avoiding these problems:

- Genetics – breed sheep that are calmer
- Grahame Rees: **low-stress stock-handling**

Ewe psychology – Why you should care

‘Modern’ Sheep Management: We force them to do what we want:

- 1) To move in a certain direction
- 2) To mate at a precise time (eg, for AI), we dominate their reproductive system with artificial hormones

Gentle and natural alternative: ‘teasing’

Ewe psychology – Why you should care

‘Modern’ Sheep Management: We force them to do what we want:

1) To move in a certain direction

2) To mate at a precise time

And ...

3) We mess up the bonding between ewe and lamb

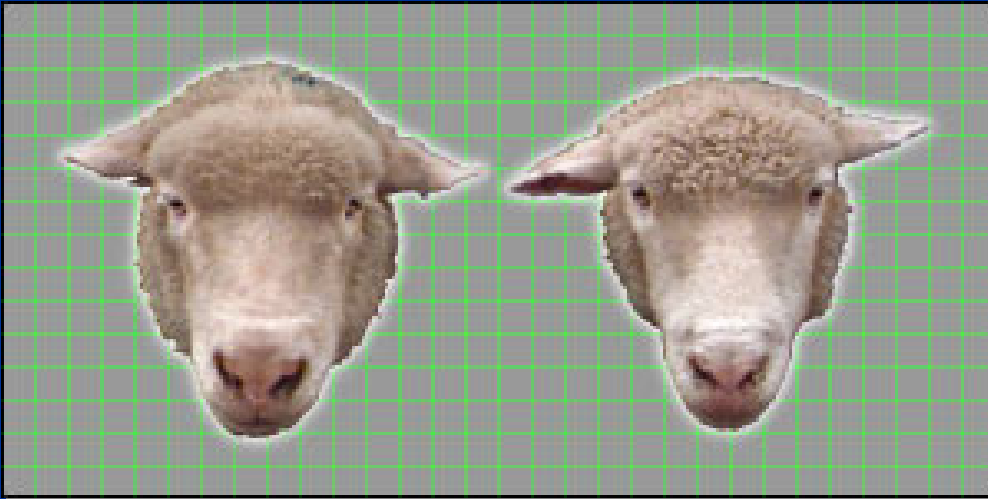
- Poorly trained predators, Noisy motorbikes
- We don't know what ewes and their lambs need
- So lambs die ...

Ewe psychology – Three Topics for Today

- 1) Sheep Memory #1 – Faces
- 2) Sheep Memory #2 – Smells
- 3) Temperament

Ewe psychology – **Memory for Faces**

Keith Kendrick, University of Cambridge (UK)



Ewe psychology – **Memory for Faces**

Sheep remember 50 different sheep faces for at least 2 years

Implications:

Identify each other with **visual memory**

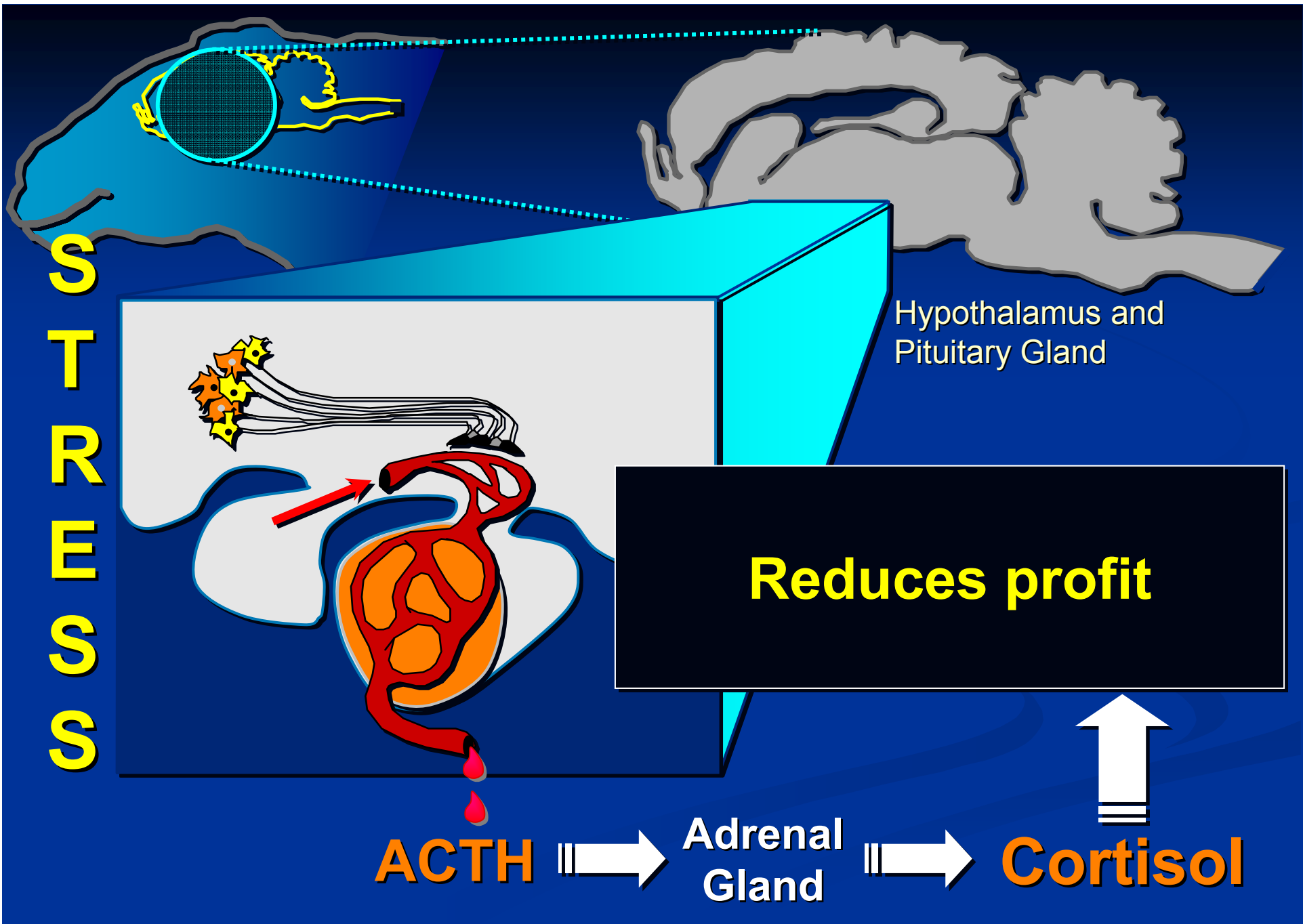
Why do they need it?

Tell friends from bullies – the dominance hierarchy

Industry: mixing flocks? Unknown faces = stress

Is stress so bad?

**S
T
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S**



Hypothalamus and Pituitary Gland

Reduces profit

ACTH → **Adrenal Gland** → **Cortisol**

Ewe psychology – **Memory for Smells**

Olfactory memory – much better than us!

How do we know?

Two situations:

1) **Mother-young recognition**

- Ewes **learn** to recognise their new-born lambs by smell
- Use the memory to detect interlopers, prevent access to the udder



Ewe psychology – **Memory for Smells**

Who does this research?

The Franco-Australian Team:

Australia

- David Lindsay
- Trish Murphy
- Dominique Blache
- Samantha Bickell

France

- Pascal Poindron
- Raymond Nowak
- Frederic Levy
- Pierre LeNeindre

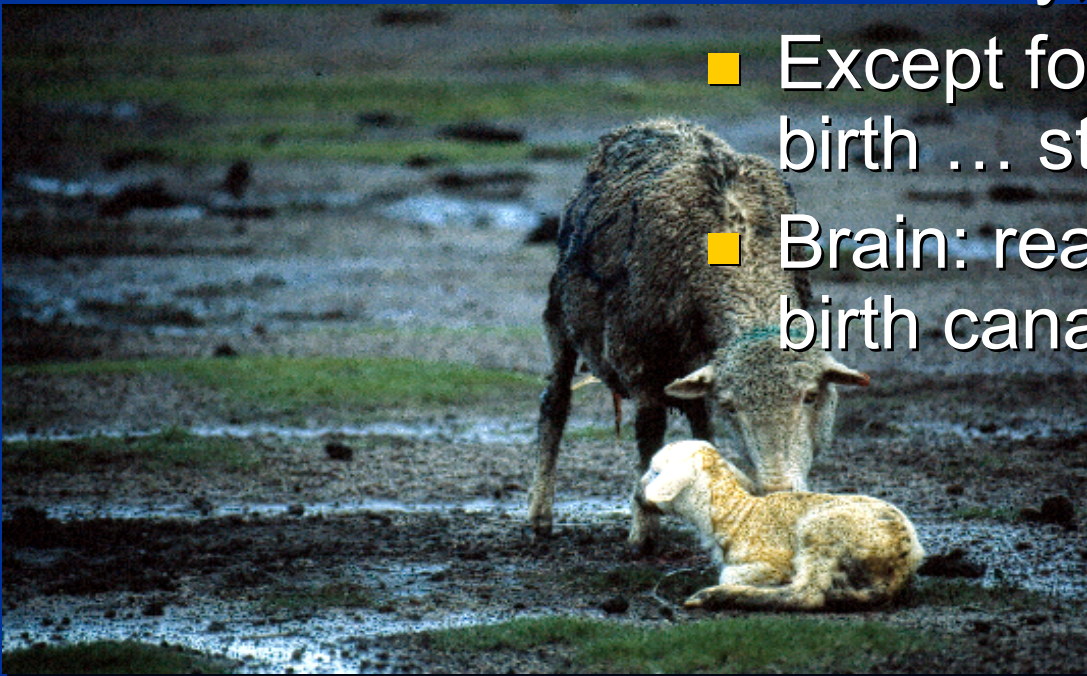


Ewe psychology – **Memory for Smells**

The biology of ewe-lamb recognition

Amniotic fluid – the smell

- Normally, ewes strongly repelled
- Except for a few hours around birth ... strong attraction
- Brain: reads signals from the birth canal as it is stretched



Ewe psychology – **Memory for Smells**

The biology of ewe-lamb recognition



What can go wrong?

- Brief period of attraction – second twin might be rejected
- Flock lambing in a small area: ewes in their period of attraction will steal lambs

Ewe psychology – **Memory for Smells**

The biology of ewe-lamb recognition

What can go wrong?

- Brief attraction period; lambing in small area
- Slow-learner ewes ...
 - Genetic variation
 - Genotypes – Meat breeds v Merinos
- Ewe leaves the birth site too early ...
 - Bred to flee from humans, dogs, machines
 - Search for food and water



Ewe psychology – **Memory for Smells**

Lets not forget ... the psychology of the lamb

First task of the newborn: find the food supply

Colostrum:

- Energy to fight the cold
- Short-cut to disease resistance
- **New:** identify mother, cement bond
- Where can it go wrong?
 - Colostrum let-down delayed
 - Poor feed in last week of pregnancy
 - Especially maidens, twin-bearers



Ewe psychology – **Memory for Smells**

Olfactory memory – the memory of odours
– much better than us!

How do we know?

Two situations:

- 1) Mother-young recognition
- 2) 'Teasing' (the 'ram effect')

Discovery: early 1940s by Eric Underwood in WA

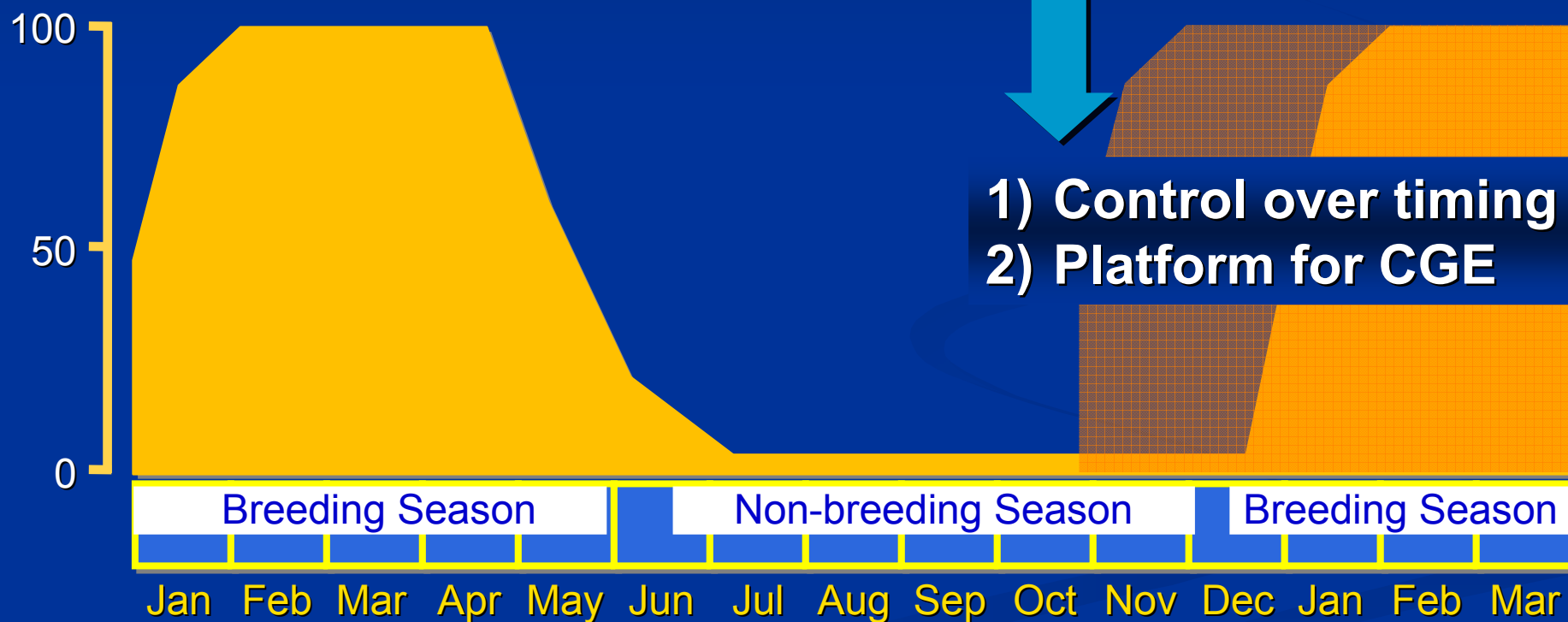
How does it work?

'Teasing' (or the 'Ram Effect')

Male



% Ewes Cycling



Ewe psychology – **Memory for Smells**

2) 'Teasing' (the 'ram effect')

Researchers: Penny Hawken, Trina Jorre de St Jorre

- Ewes will only respond to 'unfamiliar' males
- Not visual, but olfactory – odour of the male
- Ewes recognise, learn and remember individual males by their smell
- Brain process similar to lamb recognition

Ewe psychology – **Memory for Smells**

2) 'Teasing' (the 'ram effect') and memory

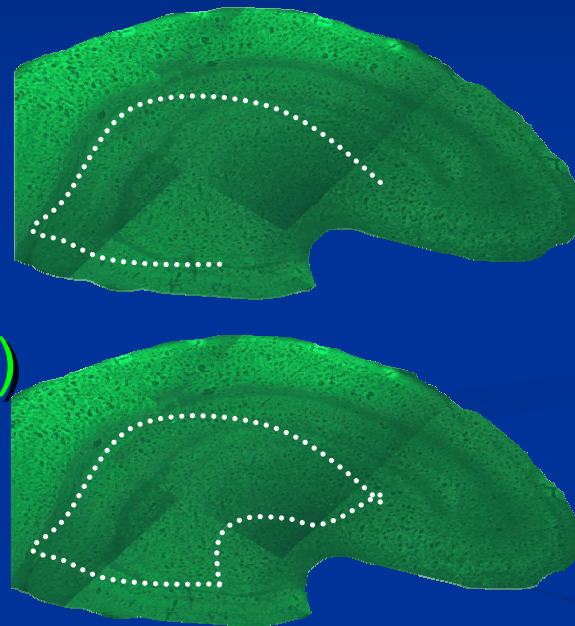
Dogma

- Brain has a fixed number of cells
- As life progresses, the number can only fall
- No repair, no growth

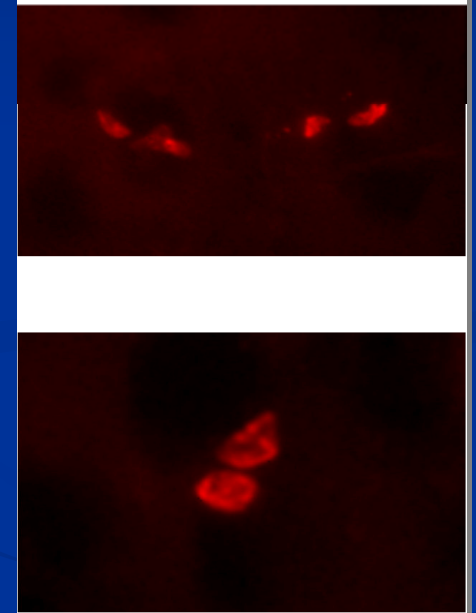
Ewes only respond to novel males ...
So they recognise, remember individual males



Hippocampus
(the memory region)



BrDU stains
new DNA



Ram odour increases cell division in the memory centres of
the ewe brain ... new cells = new memory

Ewe psychology – **Memory for Smells**

2) 'Teasing' (the 'ram effect') and memory

- Dogma – brain has a fixed number of cells; as life progresses, the number can only fall – no repair, growth
- **WRONG!** The smell of a new ram induces new memory cells in the ewe's brain
- But wait ... there's more! Ewes are not born with this ability – they need to **learn** the link between male smell and reproduction

Ewe psychology – **Memory for Smells**

2) 'Teasing' (the 'ram effect')

How is this useful to us?

Responses to teasing are variable

- Maiden ewes ... have not learned enough?
- Were the teaser males really "unfamiliar"?
- How long does it take to forget individual males?

Important for low-cost, CGE management

Ewe psychology – **The Genetics**

- **Temperament** – UWA Allandale Flock:
- Research team: Dominique Blache, Drewe Ferguson
 - 20 generations: reaction to isolation, presence of people
 - Two lines: “Calm” and “Nervous”
 - Highly heritable for a behaviour trait (0.4)
- Important? Nervous ewes have a few problems:
 - Desert their lambs when they see a human
 - Probably less resistant to disease and parasites
 - More stressed by the presence of people
 - Lower reproductive efficiency
 - Harder to shear ...

Ewe psychology – **Conclusions**

We can gain a lot from ewe psychology:

- Curiosity!
- Better manage behaviour and improve it:
 - Improve production efficiency
 - Less labour to manage the flock
 - Higher quality products
 - An industry image we can keep being proud of
 - Take the high ground ...



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The truth about sheep

Sheep behaviour

Until they get to know them, many people see sheep as dull and uninteresting animals. The truth is very different.

It is often difficult for people to recognise and understand sheep behaviour, because most of us are not used to being around sheep and because their facial structure makes it difficult for us to read emotion on their faces, like most of us can with cats and dogs.

Sheep have uniquely individual natures and are social, intelligent animals. As prey animals, they have a highly-developed flocking instinct, and prefer to move in groups rather than as individuals. Much of the behaviour seen in sheep is governed by a fear instinct (common in all prey species), and they are dependent on their flock for safety and comfort. They become highly distressed when separated from their flock, their fear evident when they call out for other members of their group and they will strive to rejoin the group.



- [Live Animal Exports:
Get the Facts](#)
- [Our Investigations:
Exposing the Cruelty](#)
- [The Al Kuwait Court Case](#)
- [Industry Claims](#)
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PLAY VIDEO

Investigations
Reveal the
Brutal Truth...



EYE WITNESS

An investigative
tour of the
Middle East



The Psychology of the Ewe

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Graeme Martin,

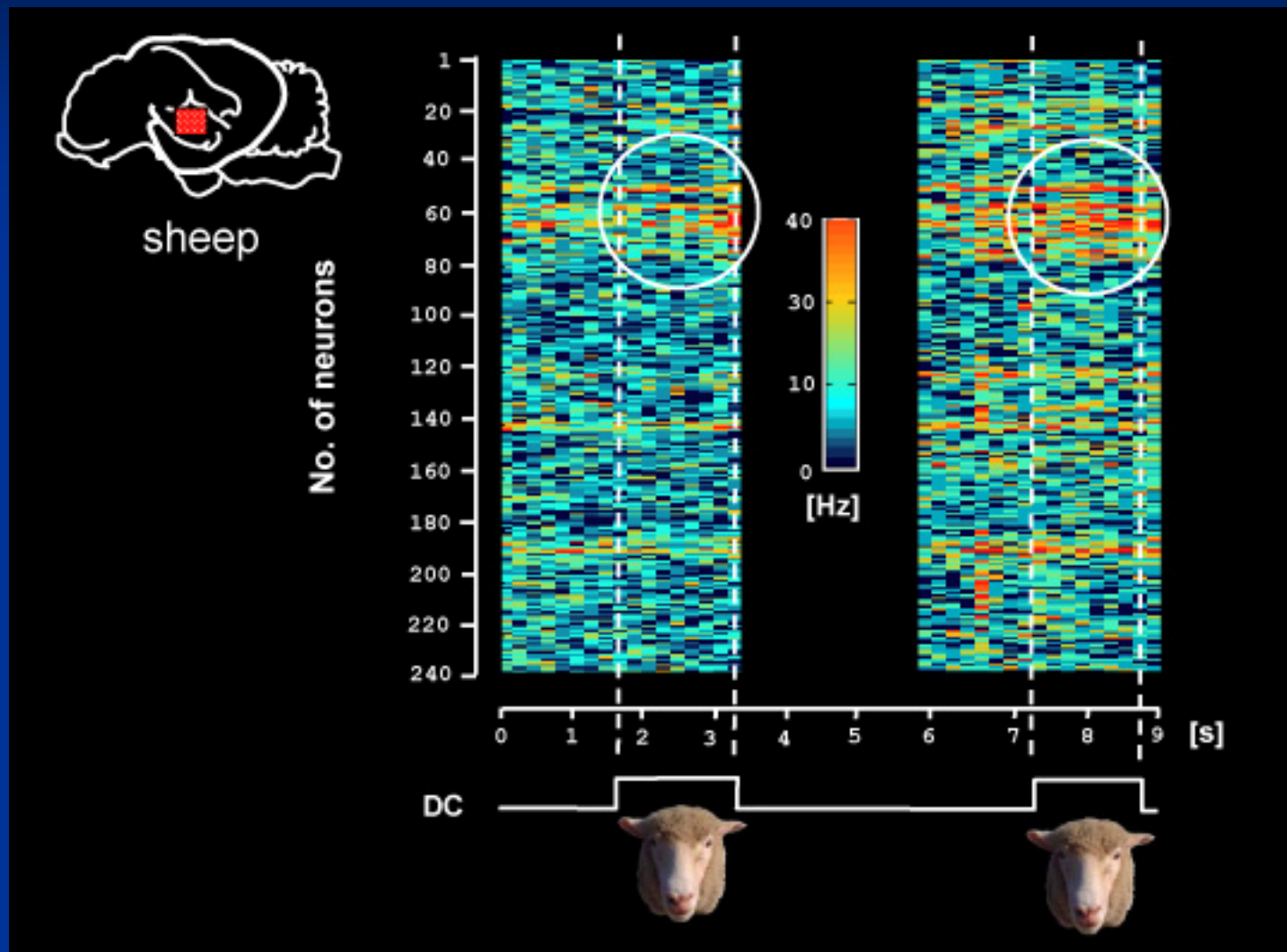
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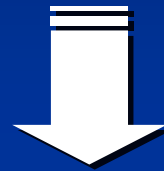
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Ewe psychology – **Memory for Faces**

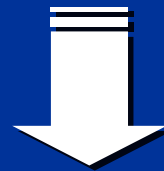


Ewe psychology – Why you should care

Better knowledge



Better management
(cheap, easy)



Nicer job +
Bigger profits

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Hormones in Our Food

Kathryn Perrotti Leavitt

Thursday, May 24, 2007

Hormones are regularly used in animal food production. Are the residues harmful to humans and who is most vulnerable to their effects?

[Not Under My Roof](#)

Olivia Newton John and Kelly Preston highlight household risks and safer alternatives.

[Learn more](#)[Buy the DVD \(\\$15\)](#)

Rose has a 3-year-old son who was breastfed for a few years and now drinks only organic milk and eats only organic food.

"The amount of chemicals and hormones in our food is horrifying," says Rose. "And most of the research ignores kids."



[The Animals](#)

[The Environment](#)

[Alternatives to Wool](#)

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[FurlsDead.com](#)



[CowsAreCool.com](#)

[Pink Calls for
Boycott of
Australian Wool
Until Lamb
Mutilations and
Cruel Live Export
Practices End](#)

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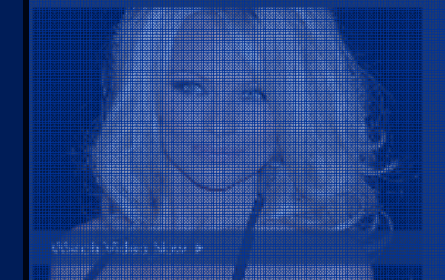
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Boycott Australian Wool

“... sheep are mutilated and castrated without painkillers, then disposed of by being slaughtered in the Middle East, after enduring a grueling, weeks- or months-long journey on overcrowded, disease-ridden ships with little access to food or water through all weather extremes.”

[Features](#)

[New Show | on PETA TV](#)

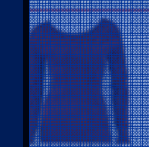


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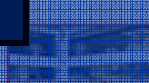
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save the sheep!](#)



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Cow burps make for bad air Down Under

ENN®

By Environmental News Network staff

A burping cow is a polluting cow. Belching cows and sheep annually produce 90% of Australia's **methane** emissions in the agricultural sector ...



Gastronomical emissions:
Cows, which have doubled in population in the last 40 years

Why study sheep psychology!?

Who cares!?

- **Answer:** market context
- **Vision:** Sheep management that takes advantage of new market forces – Clean, Green and Ethical (CGE) Sheepmeat Production