# Biology and behaviour of pigs in natural and semi-natural conditions

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# Content

- Introduction
- Sense ability
- Thermoregulation
- Feeding behaviour
- Social behaviour
- Maternal behaviour

# Introduction

**Animal's inherent "nature"**

- Domesticated 9000 years ago
- Genetic adaptation to the environment
- Physiological and anatomical changes
- Few behavioural changes

# Introduction

- Many behaviours similar to the wild boars

  - Exploration
  - Nest building

- If the animal can not perform theses behaviours: Welfare problems

# Sense ability

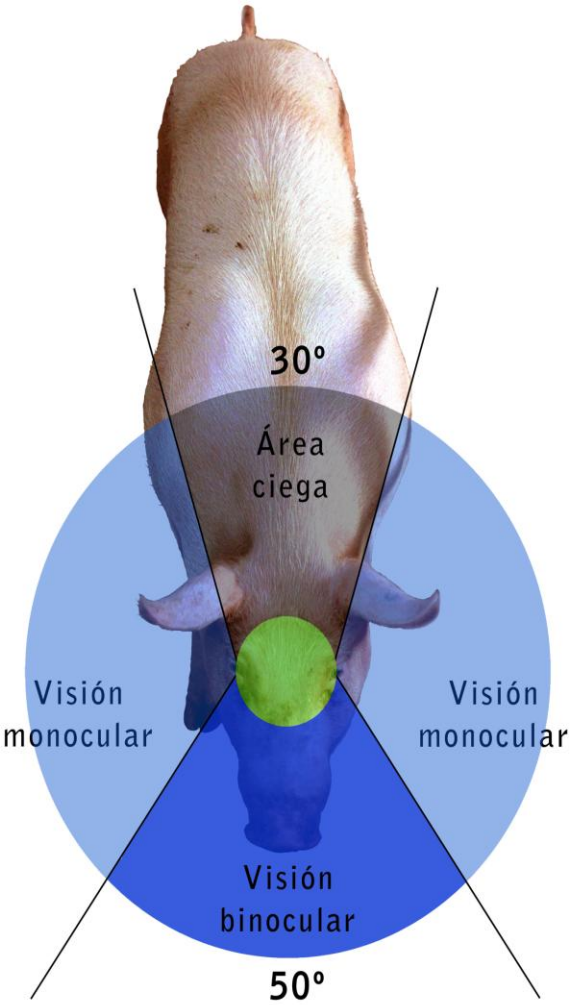
- Well developed senses and learning ability.

| | Humane | Pigs |
|---|---|---|
| • Vision | *** | |
| • Hearing | | *** |
| • Smells | | *** |
| • Taste | *** | *** |
| • Feel | *** | |

# Sense ability

## Vision

- In colours
- Short
- Narrow-angle binocular vision (50º)
- Wide-angle panoramic vision (330 º) (monocular)
- Sensitive to contrasts of light and dark



# Sense ability

**Hearing**

- Very sensitive to high-frequency sounds (7.000 –8.000 Hz)
- Very stressful intermittent sounds

**Smell**

- More sensitive than human
- Can smell fear/sexual pheromones

**Learning ability**

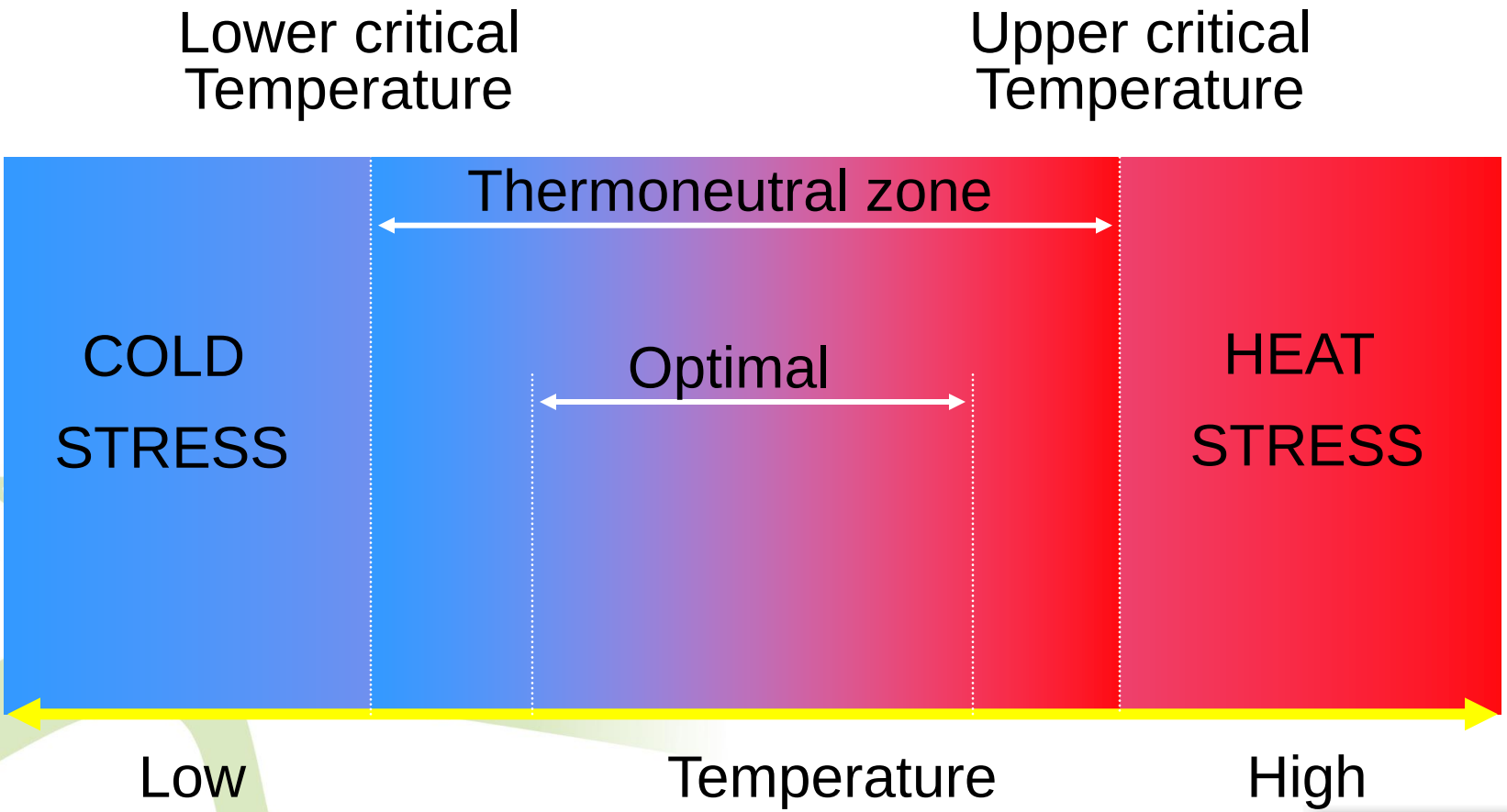
# Thermoregulation

- Homeotherms (regulate temperature close to a set point)

- Endotherms (generate own heat)

- Normal Temperature Ranges: 39.0 ºC (38.5-40.5 ºC)

# Thermoregulation



# Thermoregulation

Typical thermal challenges

Newborn: susceptible to cold
- 50% of preweaning loss in first 48h

Mature animals: more susceptible to heat (surface area:volume ratio)

BUT depends on:
Level of feeding
Level of performance

# Thermoregulation

Heat stress and Lactation in Sow

| Temperature | 20ºC | 30ºC |
|---|---|---|
| Sow respiration rate (/min) | 31 | 71 |
| Feed intake (kg/day) | 8.1 | 5.2 |
| Sow weight loss (kg) | 6.4 | 21 |
| Mild yield (kg/day) | 10.3 | 6.6 |
| Piglet mortality (%) | 3.8 | 8.0 |
| Piglet weaning weight | 7.4 | 6.2 |

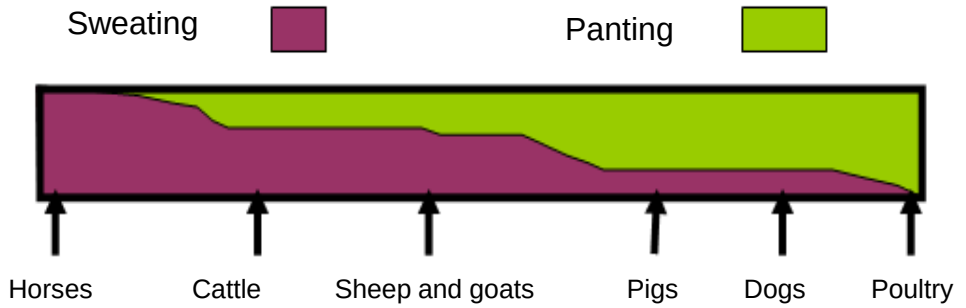
Vidal et al., 1991

# Thermoregulation

**Thermoregulatory Response:**

**Physiological:**
- Heat production (shivering
- Insulation (piloerection/bloodflow)
- Heat loss (increased respiration)

**Behavioural:**
- Activity level
- Posture
- Change of location
- Wallow
- Feed intake

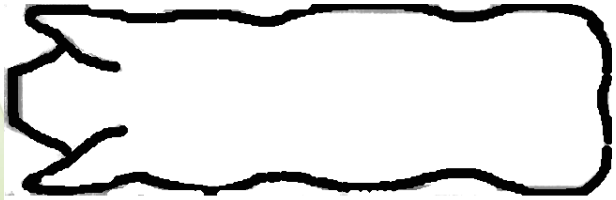


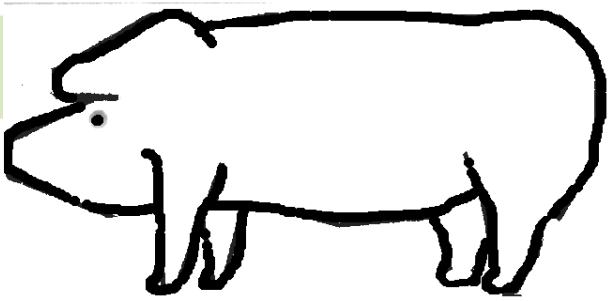
# Thermoregulation

- Lying behaviour is an important mechanism within thermoregulation

Too cold: Sternal recumbency, huddling.

Too warm: Lateral recumbency, wide separation, panting.



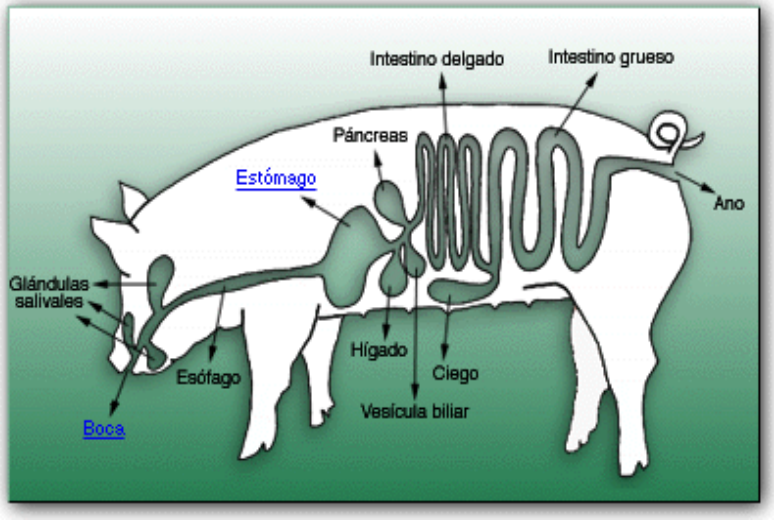


0.42 $m^2$

1.0 $m^2$

# Feeding behaviour

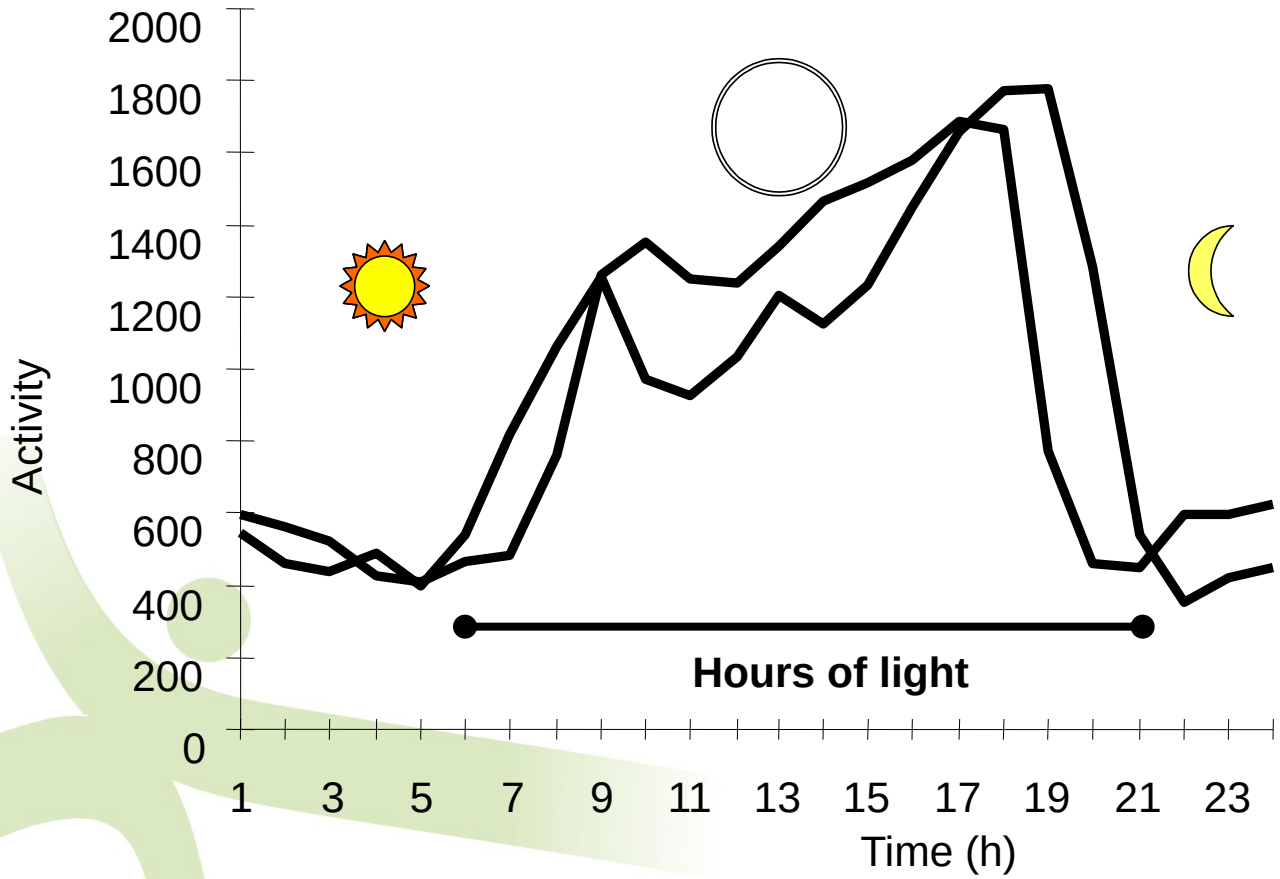
- Forest-dwelling
- Opportunistic omnivore
- Scavenger



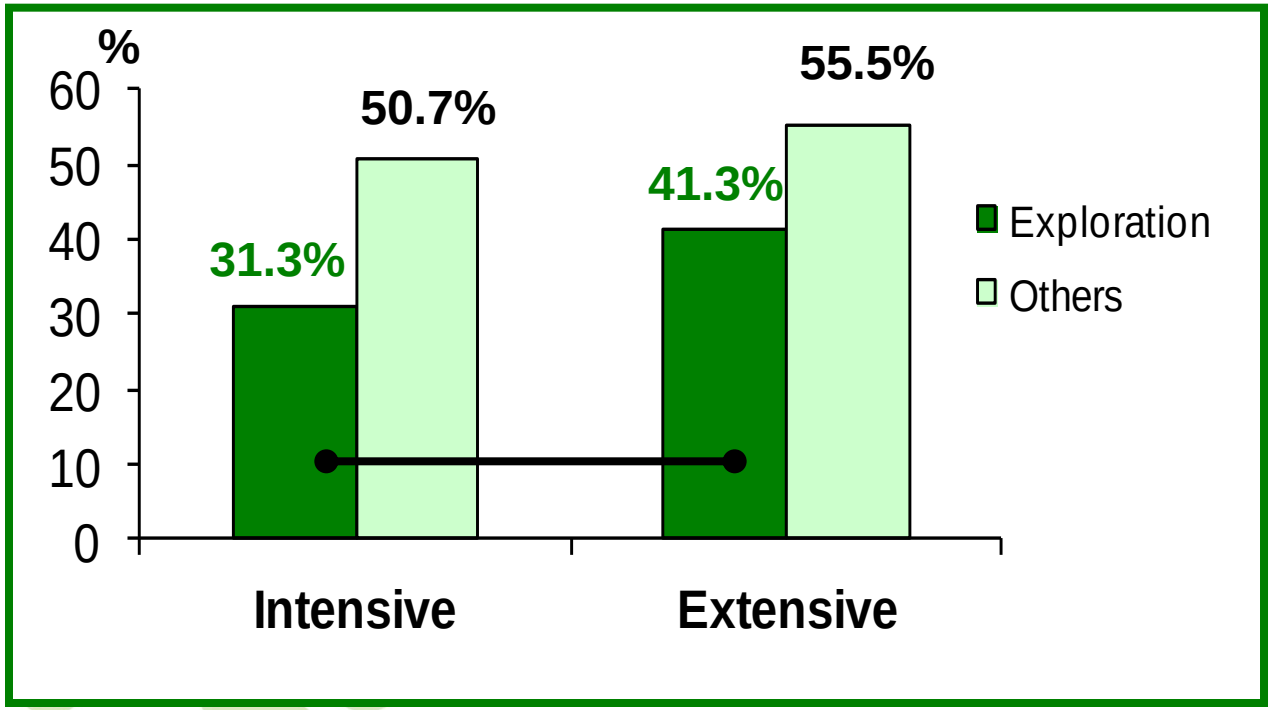

**Exploratory behaviour:**

- Appears early in its development
- From 6 to 8 hours a day
- Highly motivated behaviour

# Feeding behaviour



# Exploratory behaviour




**OR= - 0.43**

(Temple et al., 2011)

**Exploration was more frequent in extensive Iberian pig conditions ($p<0.05$)**

# Social behaviour

**In society**

- Defence against depredator

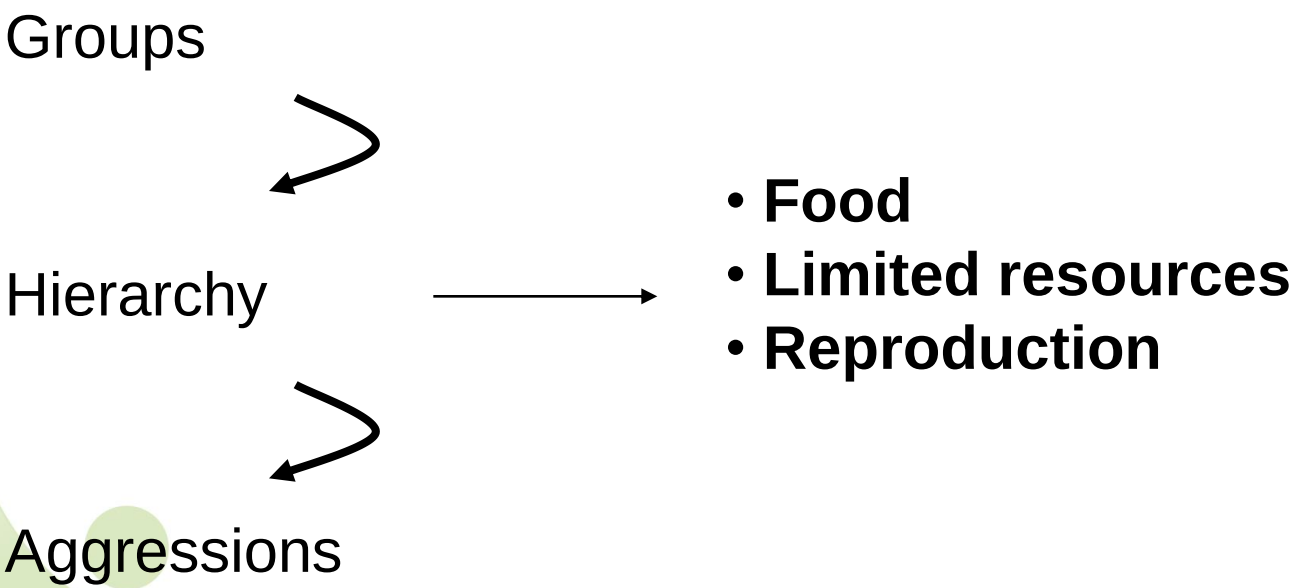
- Access to food

- Maternal groups
  (mothers with newborns and offspring of the previous year)

- Dynamics groups of 10-12 animals

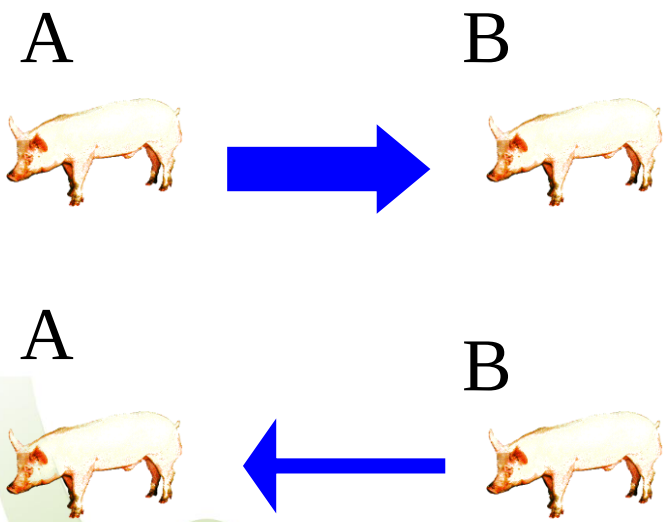
- Males: Solitary or in unstable groups

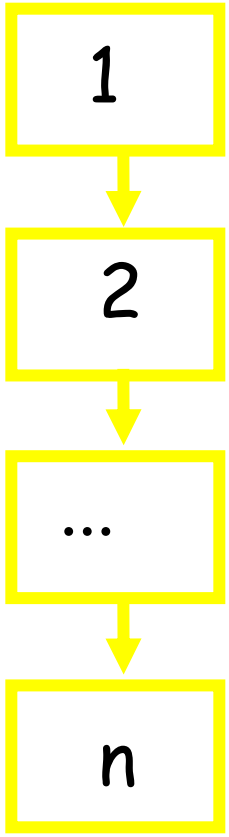
# Social behaviour



# Social behaviour

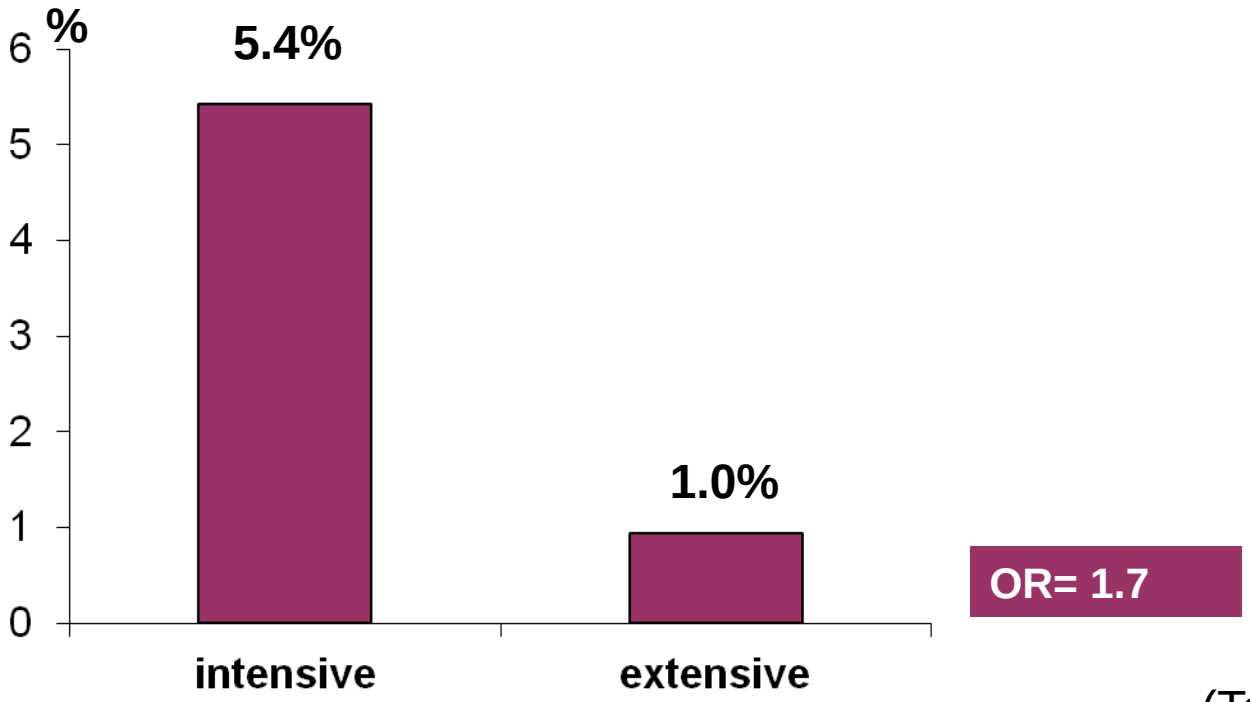
Agonistic behaviours




- Asymmetric relationship between A and B
- Weight, age and temperament affect hierchial relationship

# Agonistic behaviour




(Temple et al., 2011)

**Intensive pigs show more negative behaviours than extensive Iberian pigs (p<0.0001)**

# Agonistic behaviour

Agonistic behaviour is less frequent in natural conditions

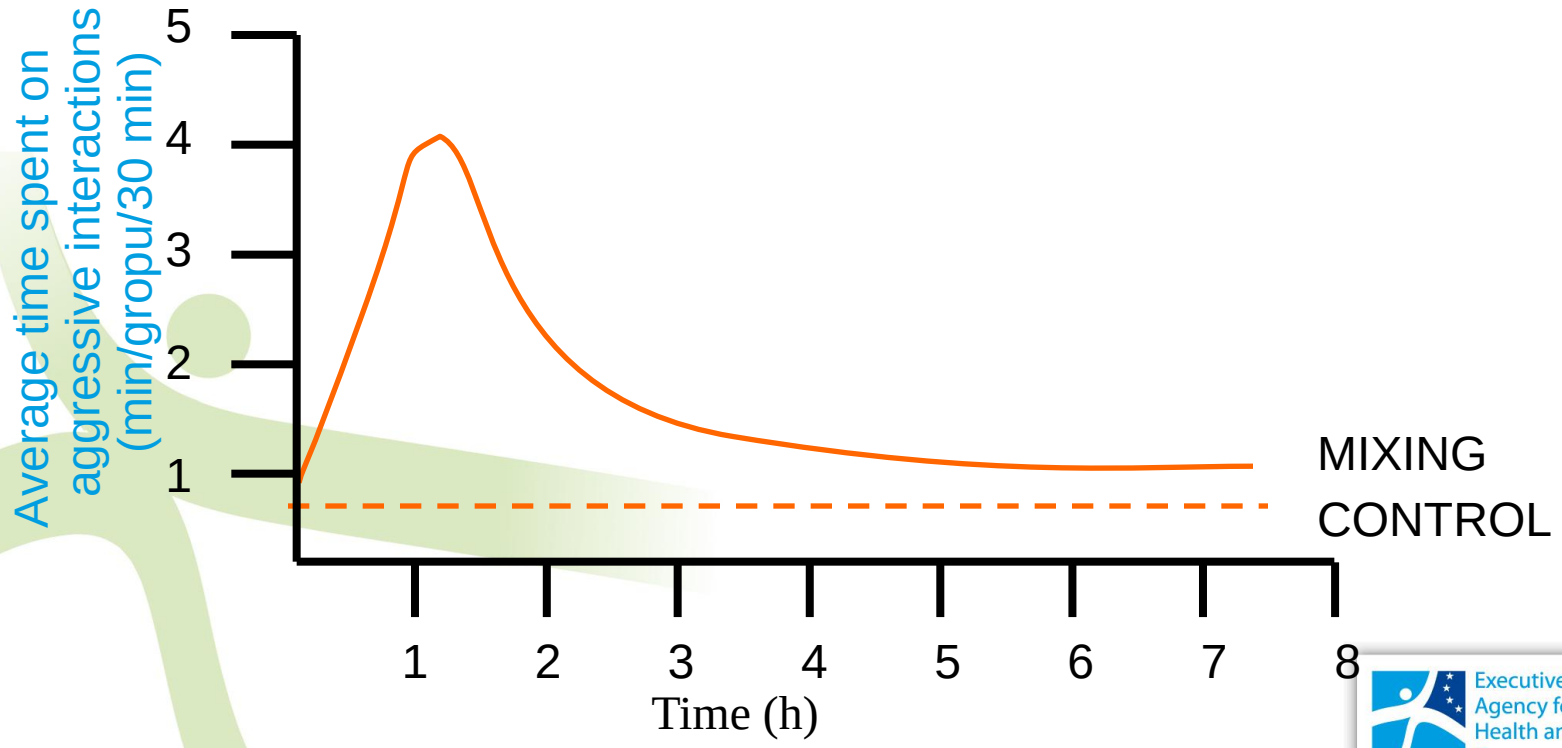
- Stable groups
- Small groups

} Facilitate individual recognition

- Progressive integration of litters
- Appeasing mechanisms (pheromones)

# Agonistic behaviour

Variations of the frequency and intensity of aggressive interactions after mixing



# Agonistic behaviour

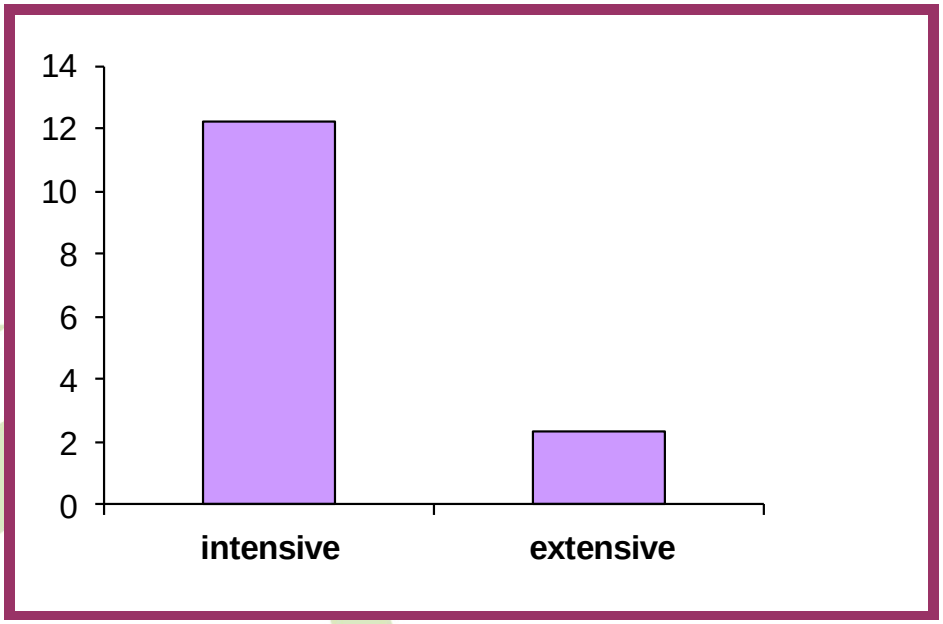
## Effects

- Physiological stress
- Result in injury and pain
- Decreases food consumption
- Increase weight variability
- Worsens conversion rates
- Cause immunosupression

# Positive social behaviour

**Motivation for social contacts with conspecifics**

**Lack of stimulation for other behaviours**

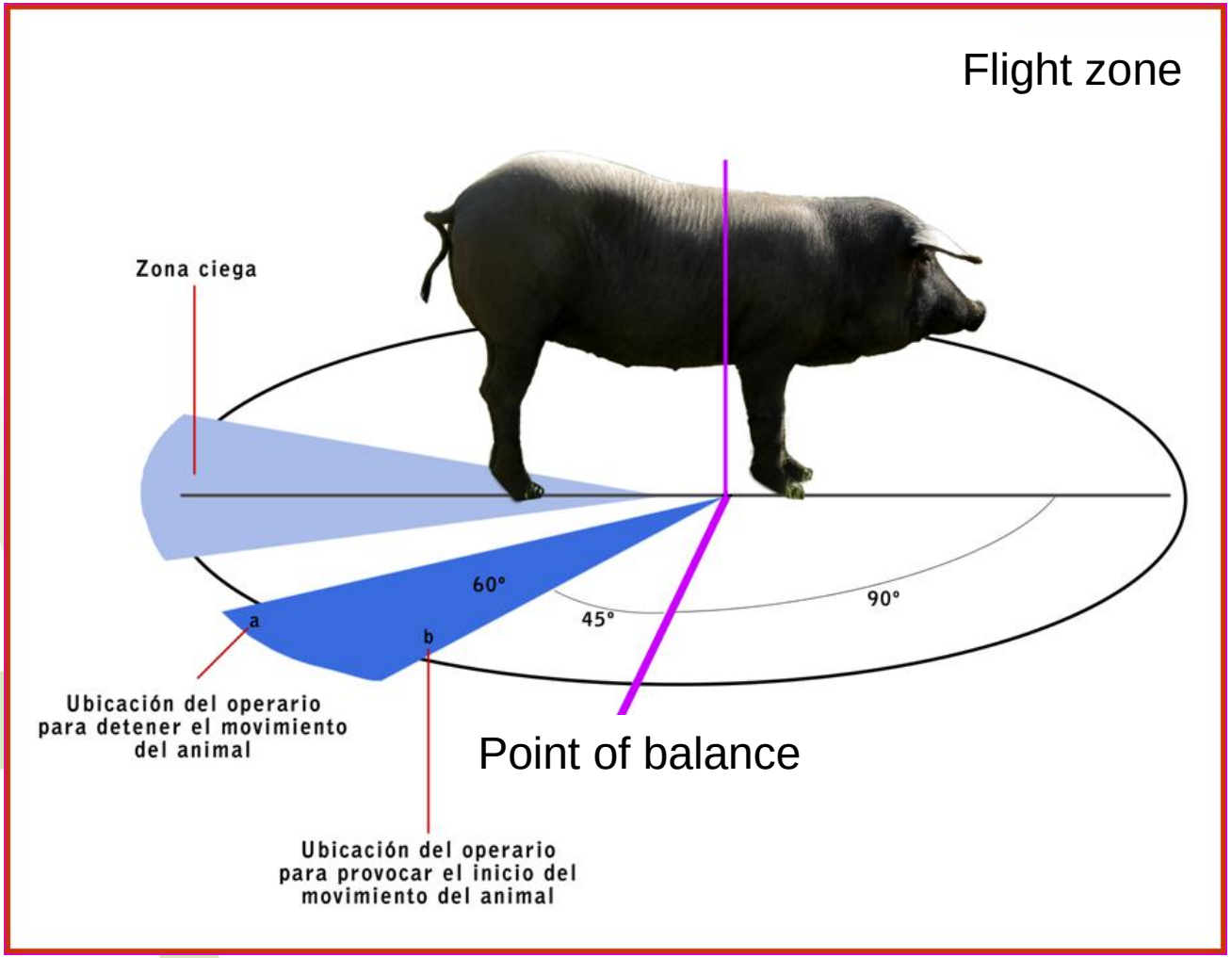



# Social behaviour

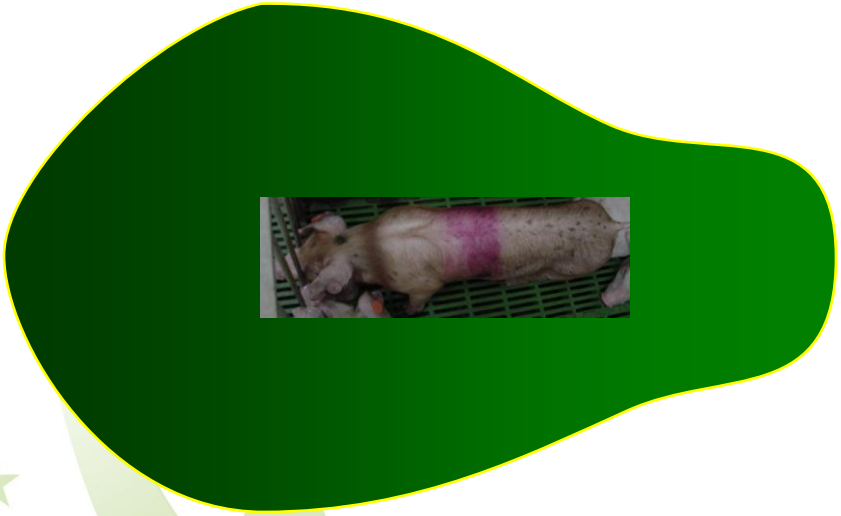
**Defence against depredator**

- Prey species (certainly not a predator)
- Vocalisation

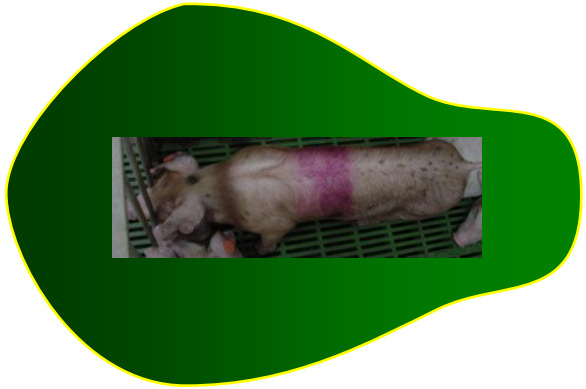
# Fight or flight



# Flight zone



Extensive



Intensive

# Maternal behaviour

**1-3 days before delivery sows:**

- Separate from the group
- Look for a place to nest
- Dig with the snout a circular hollow of 10 cm depth and 1.5 m diameter
- Build the nest (dried grass or straw)
- Finish 2-4 hours before birth

It is a very regular pattern

# Nest building behaviour

Depends on:

- Internal factors: Prostaglandin F2α
- External factors:

  Presence of material
  Room temperature
  Location of the nest

High motivation to build the nest

# Nest building behaviour

**Role of the nest:**

- Gives protection to offspring against predators
- Creates a comfortable environment for the sow and the piglets
- Reduces risk of hypothermia
  (Sows does not lick the piglets)

Although providing a nest, sows will try to build another

# Maternal behaviour

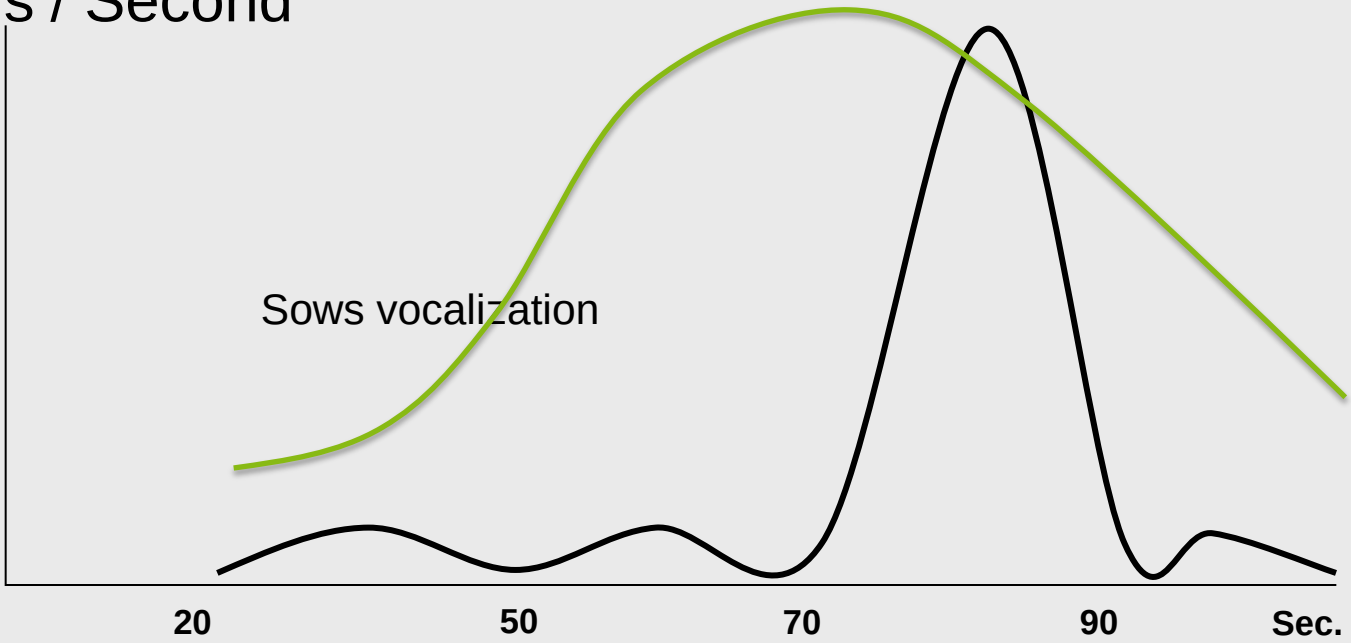
- Inactivity after birth (to avoid crushing)
- Defecate outside the nest
- Lactation (synchronization between mother and piglets)
- Each piglet has its own teat

## Hormonal regulation

Oxytocin release

Grams / Second

Milk flow




## Piglet activity

| 1st Phase | 2nd Phase | 3rd Phase |
|---|---|---|
| Massage and sucking | ingestion | Massage |

# Maternal behaviour

- 0-10 days: around the nest
- 10-14 days: Integration into the group
- > 8 weeks increased social activity
- 13-17 weeks: gradually weaning

# Thank you for your attention

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