Effect of environmental temperature on lactating sows voluntary feed intake and performance under commercial conditions

Anguita, M., Cerisuelo, A., Manzanilla, E.G., Gasa, J.

Animal Nutrition, Management and Welfare Research Group

Universitat Autònoma de Barcelona

Introduction

UAB

Introduction

The Importance of Feed Intake During Lactation

LACTATION

Milk production ↷ ↓

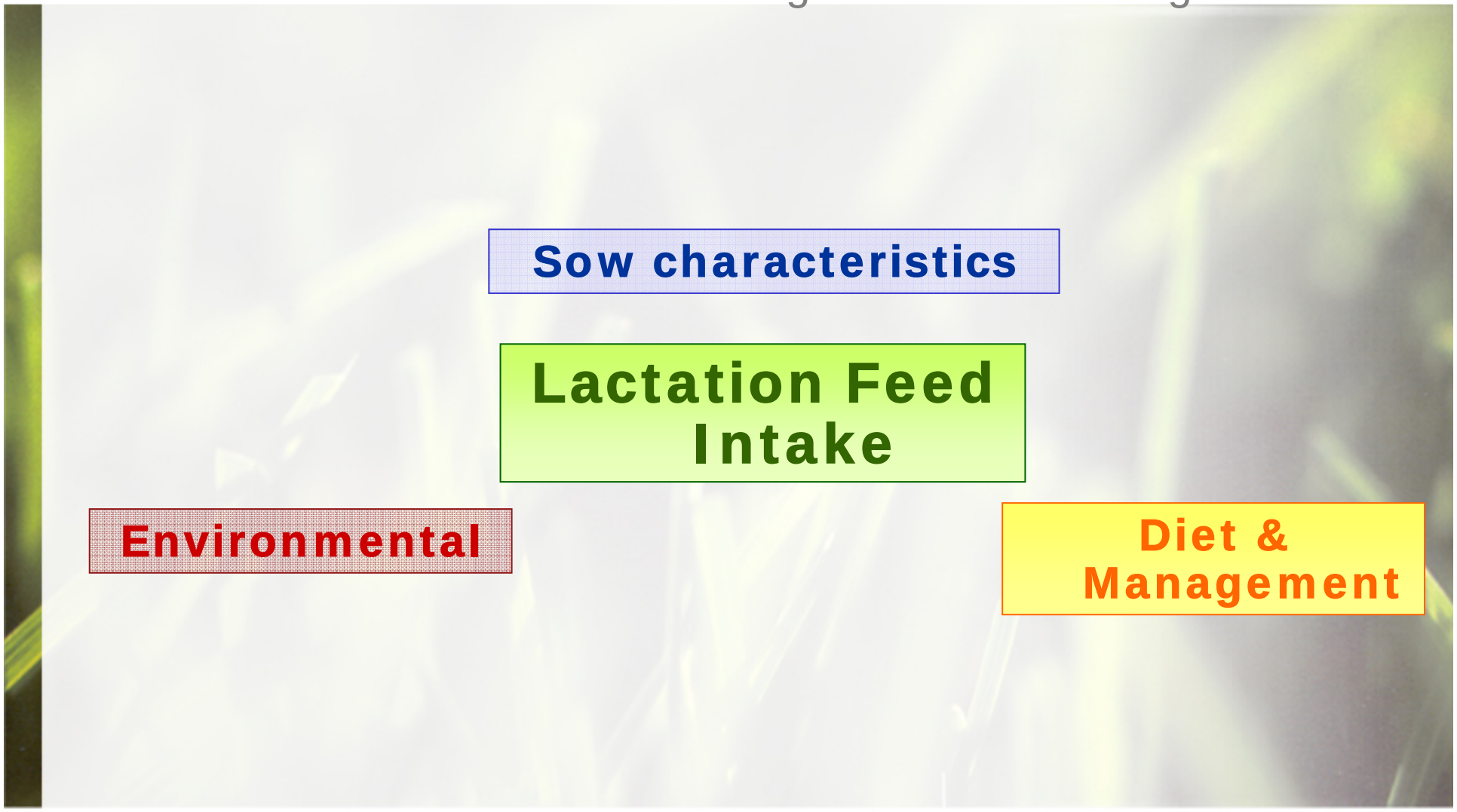
↑↑↑ **Requirements of Nutrients and Energy**

Voluntary Feed Intake

UAB

Introduction

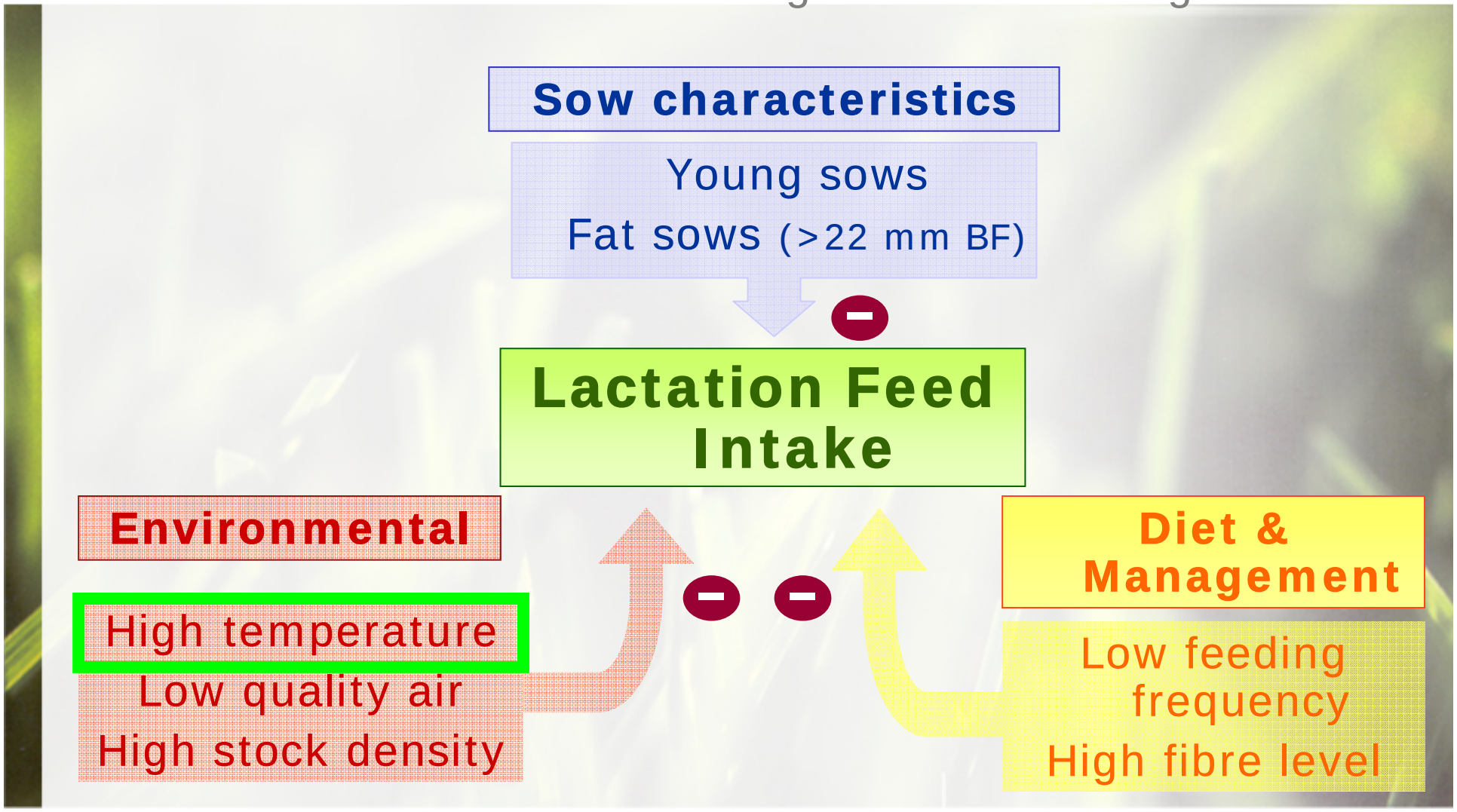
Factors Affecting Feed Intake during Lactation



UAB

Introduction

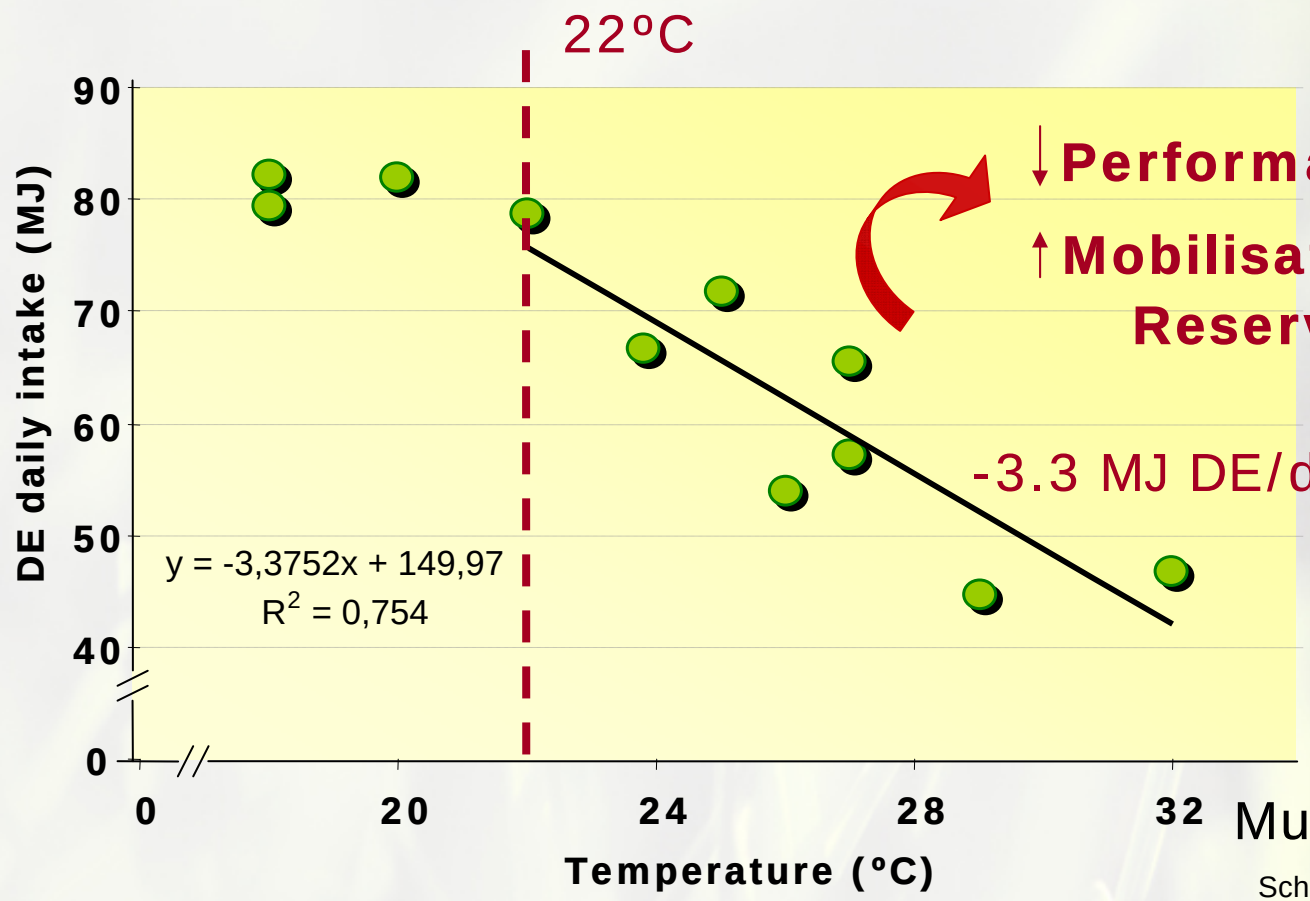
Factors Affecting Feed Intake during Lactation



UAB

Introduction

Temperature: Effect on Feed Intake



Multiparous sows

Schoenherr et al., 1989
Prunier et al., 1997
Quiniou and Noblet, 1999
Gourdine et al., 2006

UAB

Objective

Case Study

Comparation of the feed intake and the performance of lactating sows kept under commercial conditions during two seasons of the year in the North-East of Spain

UAB

Material and Methods

Material and Methods

1. Farm Characteristics

- Commercial farm located in Lleida (Spain)
- 600 sows LWxLD (bands of 15 days)
- Lactation barns provided with heaters and natural ventilation

UAB

Material and Methods

1. Farm Characteristics

2. Animals

- 160 Sows MIXED PARITIES

  80 in spring ⟶ April-May

  80 in summer ⟶ July-August

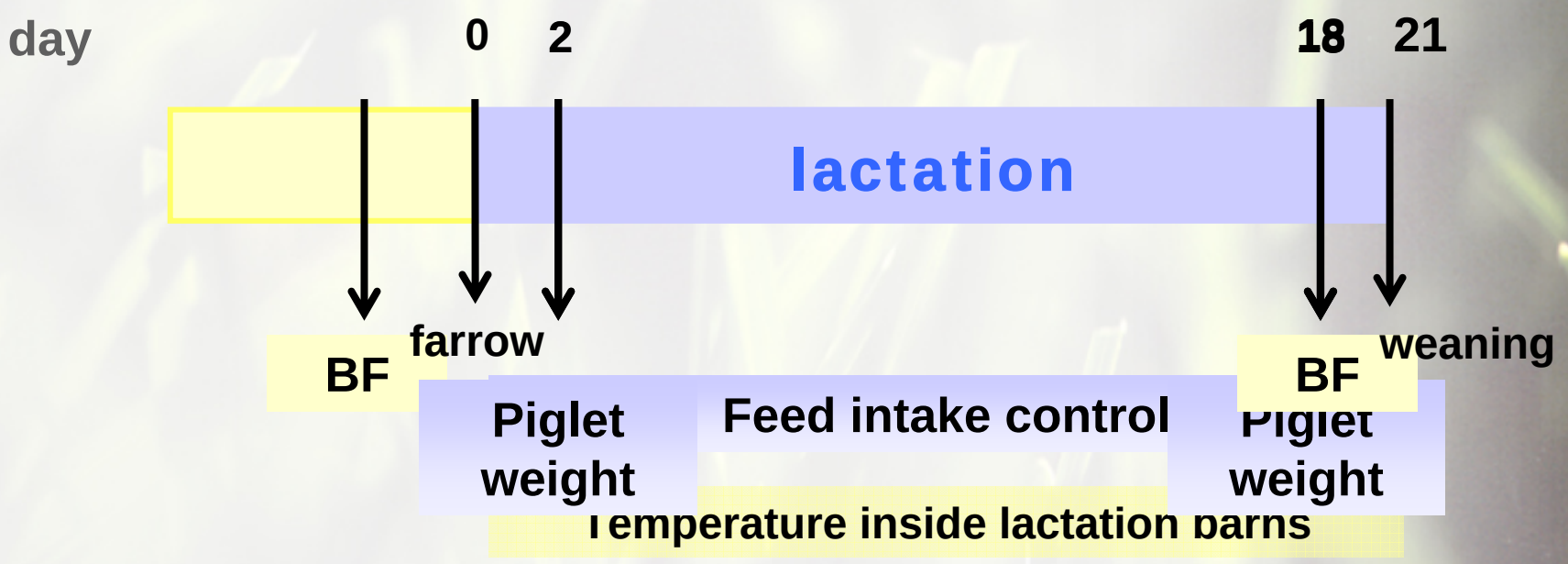
Two bands of 40 sows in each season

Distributed in 10 lactation barns

UAB

Material and Methods

1. Farm Characteristics
2. Animals
3. Controls



UAB

Material and Methods

1. Farm Characteristics
2. Animals
3. Controls

3.1. Feed intake control

- Sows fed three times daily (6:30 am, 11:00 am, 6:00 pm)
- 12.6 MJ DE/kg
- Collection of the refusals 1 h after each meal

3.2. Mean Temperatures inside the barns

- Spring: between 23.5 and 26.5 ºC
- Summer: between 27.9 and 30.3 ºC

UAB

Material and Methods

1. Farm Characteristics
2. Animals
3. Controls
4. Statistics SAS® 9.1 (2003)

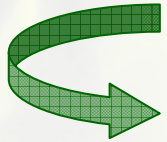
4.1 Feed intake and lactation performance ANOVA

- **BF group at farrowing (<16mm; 16 to 19;>19mm)**
- **Parity group (First; 2nd + 3rd ; > than 3)**
- **Season of the year (spring ; summer)**

UAB

Material and Methods

1. Farm Characteristics
2. Animals
3. Controls
4. Statistics SAS® 9.1 (2003)
   - 4.1 Feed intake and lactation performance ANOVA
   - 4.2 Response of Feed intake ANCOVA



Temperature, BF and Parity

UAB

Results

Feed Intake

Results

Mean daily feed intake during lactation

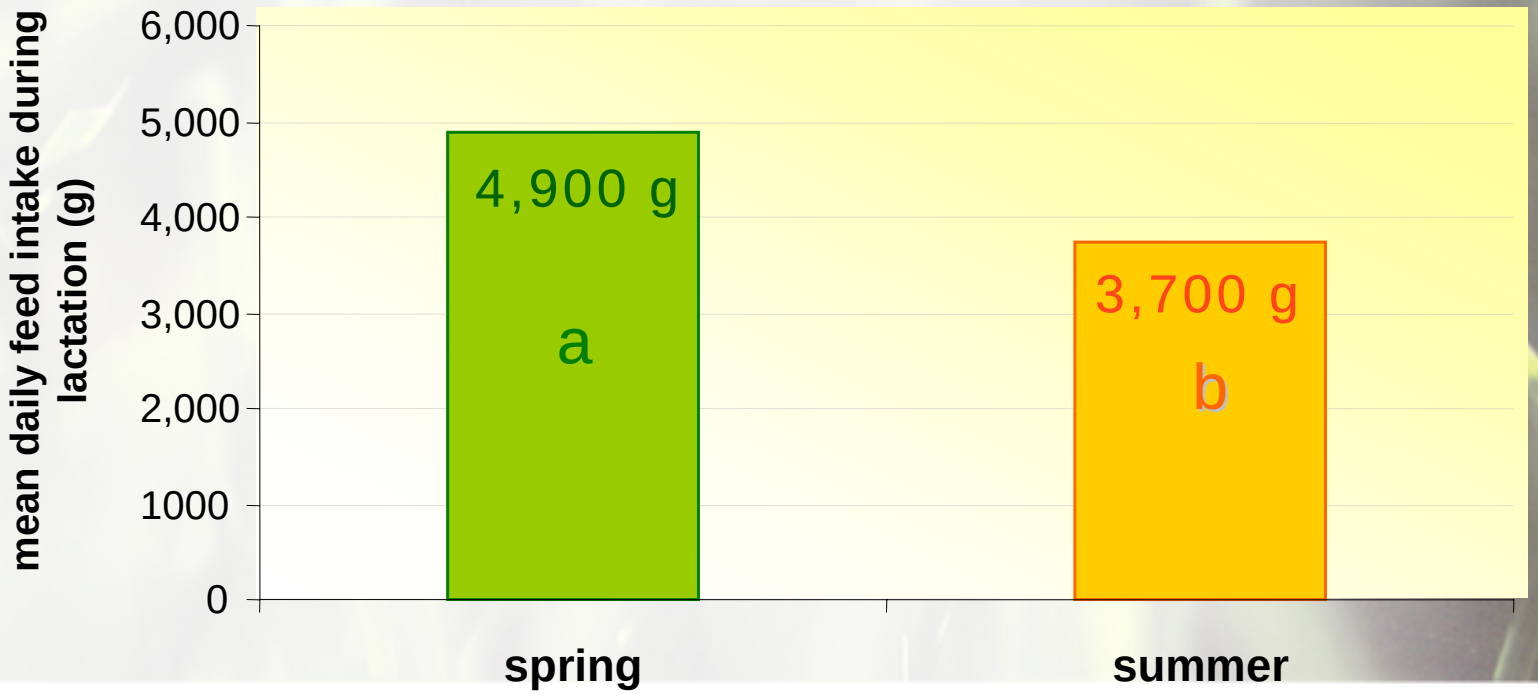
- Back fat depth group *(< 16 mm vs > 19 mm)*
- Parity group *(First parity vs > Three parities)*
- Season

UAB

Results

Mean daily feed intake during lactation

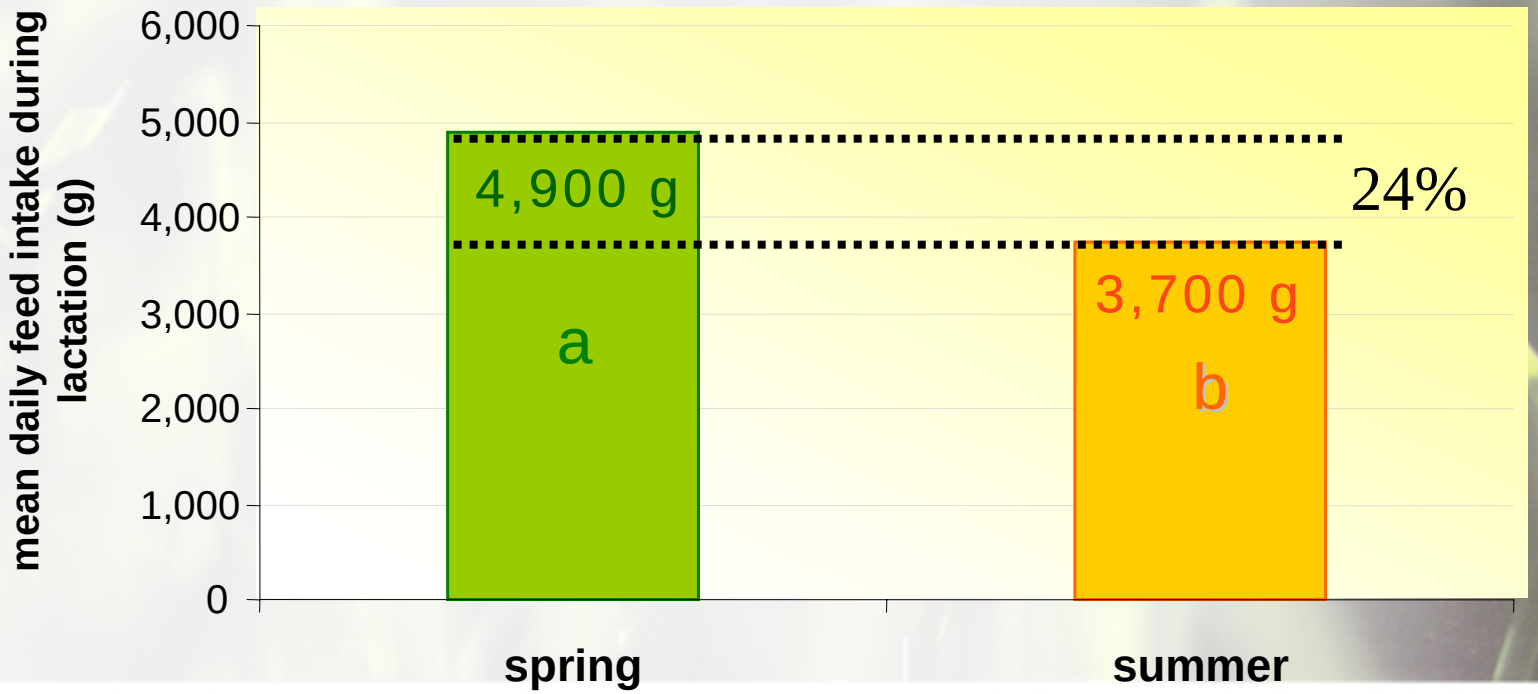
- Back fat depth group (< 16 mm vs > 19 mm)
- Parity group (First parity vs > three parities)
- Season



Results

Mean daily feed intake during lactation

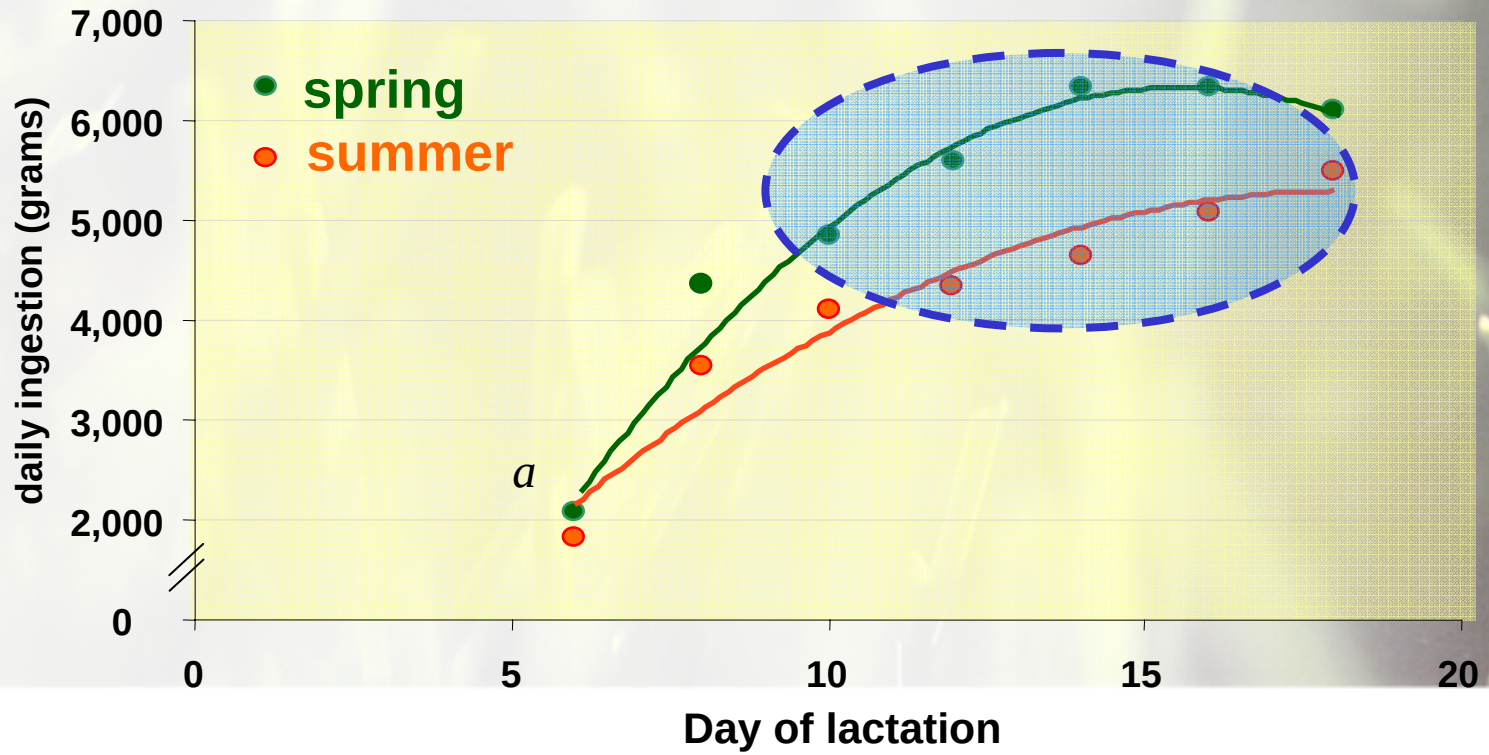
- Back fat depth group (< 16 mm vs > 19 mm)
- Parity group (First parity vs > three parities)
- Season



Results

Mean daily feed intake during lactation

- Back fat depth group (< 16 mm vs > 19 mm)
- Parity group (First parity vs > three parities)
- Season



[a]*Including from day 0 to day 7*

Results

Feed Intake: ANCOVA

Results

Mean daily feed intake during lactation

$$MDFI = 11{,}776 - 59.6BFD + 216PN - 17.4\,PN^2 - 252\,meanT \quad (g/d)$$

Results

Mean daily feed intake during lactation

MDFI = 11,776 – 59.6BFD + 216PN -17.4 PN^2 -252 meanT (g/d)

- Back fat

  lineal negative response between 8 and 34 mm

UAB

Results

Mean daily feed intake during lactation

$$MDFI\ (g/d) = 11{,}776 - 59.6BFD + 216PN - 17.4\,PN^2 - 252\ meanT$$

- Back fat depth
- Parity number (from 1 to 12 parities)

  +461 g/day between the first and the seventh

UAB

Results

Mean daily feed intake during lactation

$$MDFI\ (g/d) = 11{,}776 - 59.6BFD + 216PN - 17.4PN^2 - 252\ meanT$$

- Back fat depth
- Parity number
- Mean temperature of the room (from 23.5 to 30 ºC)

- 252 g/d for ºC that meanT increases

UAB

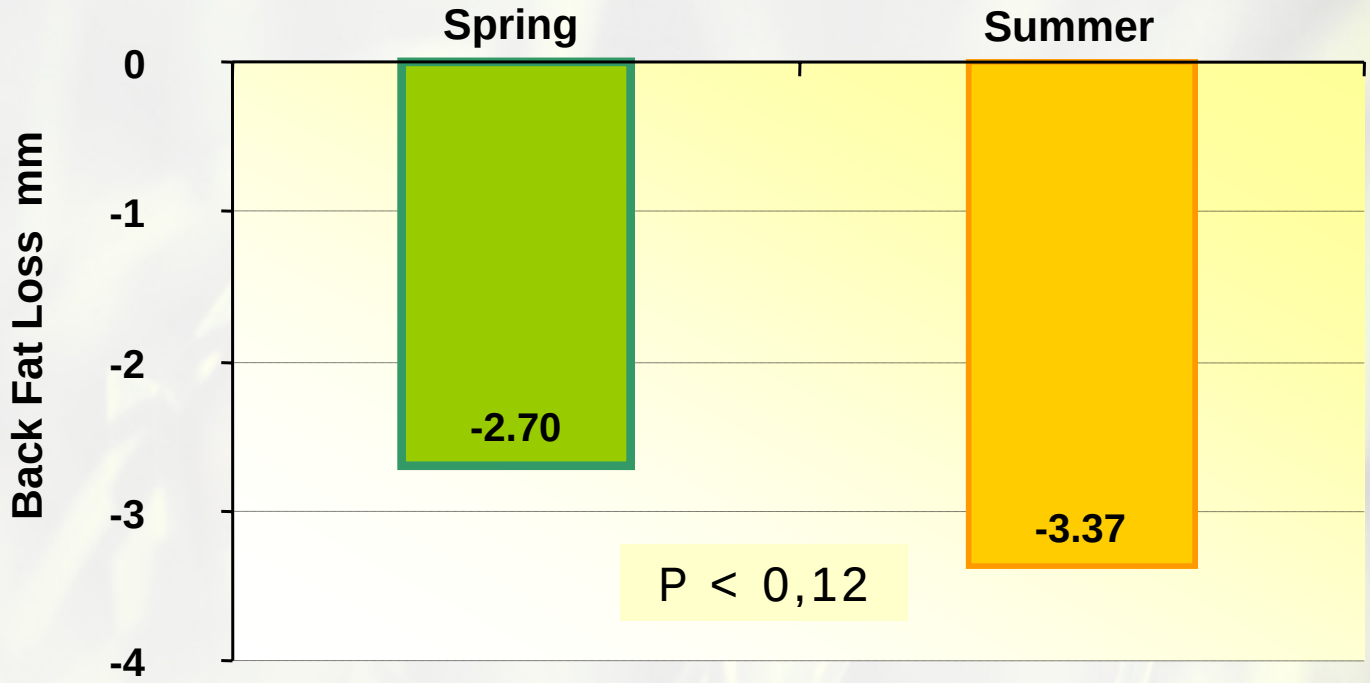
Results

Sow Performance

Results

Backfat loss during the Lactation

- Season



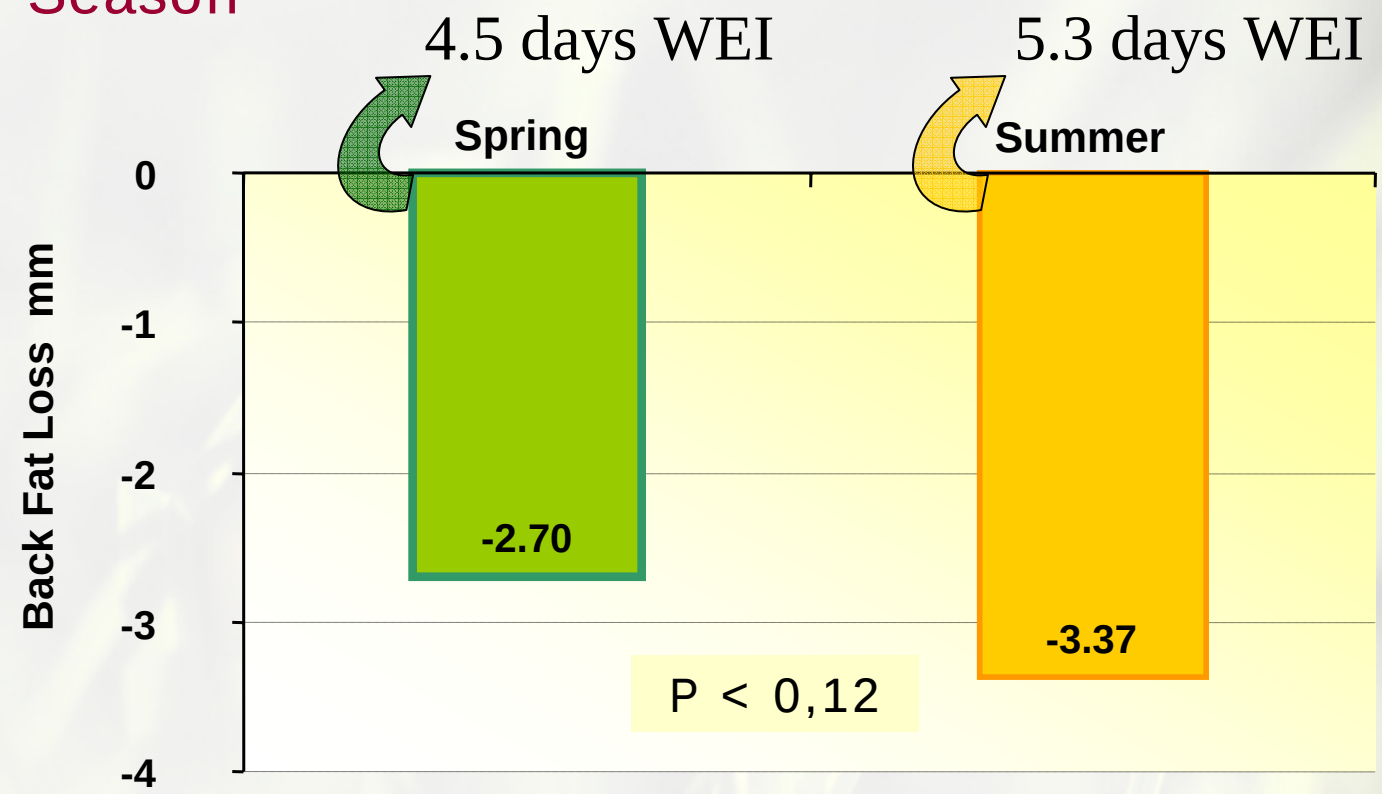
Initial Back Fat as a covariable
Parity group not significant

UAB

Results

Backfat loss during the Lactation

- Season



Initial Back Fat as a covariable
Parity group not significant

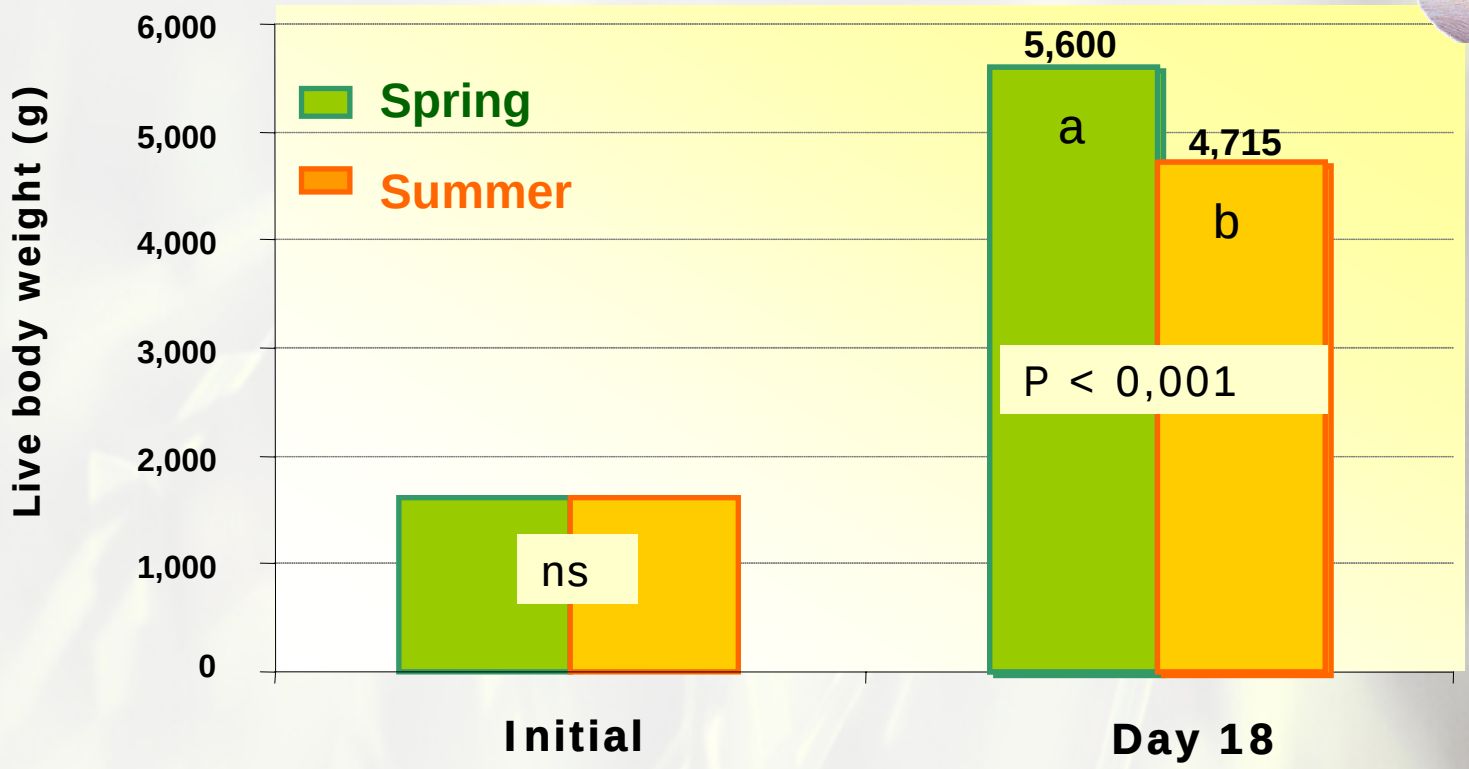
UAB

Results

Piglet Weight on day 18

- Season

Primiparous



Initial Back Fat not significant
Parity group (first parity < multiparous)

UAB

Implications

Implications

In our experimental conditions

An increase in the mean temperature in the lactation barns

from 23 to 30 ºC

Decrease in feed intake

3.2 MJ DE/ºC/day

Lower PWW

15% of reduction

Milk production

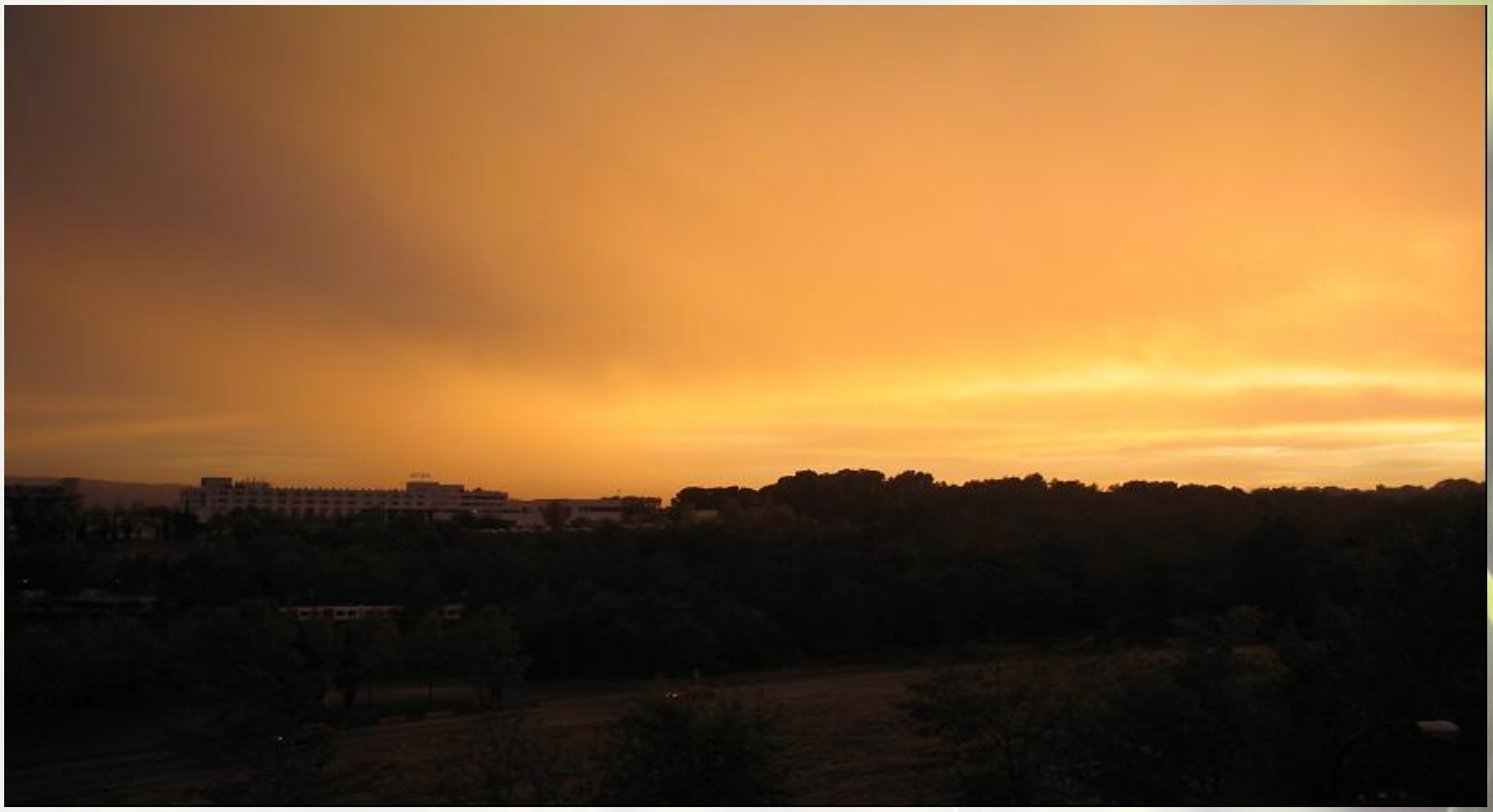
Not able to compesate

Higher mobilisation of body reserves

Increase in WEI of 0.8 days

UAB

Thanks for your attention



UAB