

## Influence of mare body conformation on growth and development of Lusitano foals until weaning

M.J. Fradinho, D. Assunção, A.L. Costa, C. Maerten, V. Gonçalves,  
P. Abreu, M. Bliebernicht, A. Vicente



## Introduction

### Expression of growth

Genetic background...



Environmental factors  
(e.g. maternal environment)

# Introduction

Maternal factors



Uterine capacity of the mare



Walton & Hammond  
(1938)



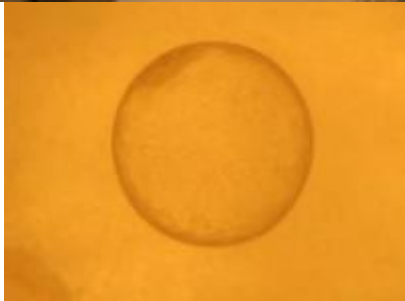
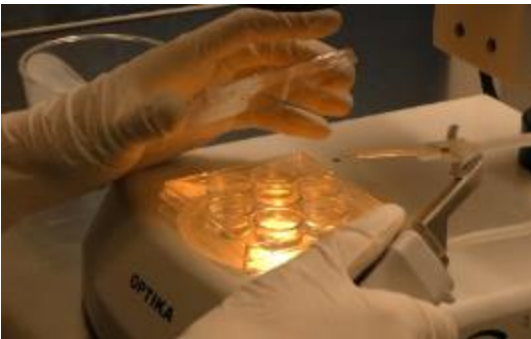
Modulation of  
offspring phenotype

Studies with **ET** techniques:

- Tischner, 2000 (Konik pony - Draft polish mares);
- Allen et al., 2004 (Pony – Thoroughbred);
- Peugnet et al., 2014 (Pony – Saddlebred – Draft french mares).

# Introduction

Embryo transfer has been widely used in the horse industry



What about the Lusitano ?



- ET was authorized from 2010;
- Only a maximum of three foals from each donor mare may be registered per year.

## Objective

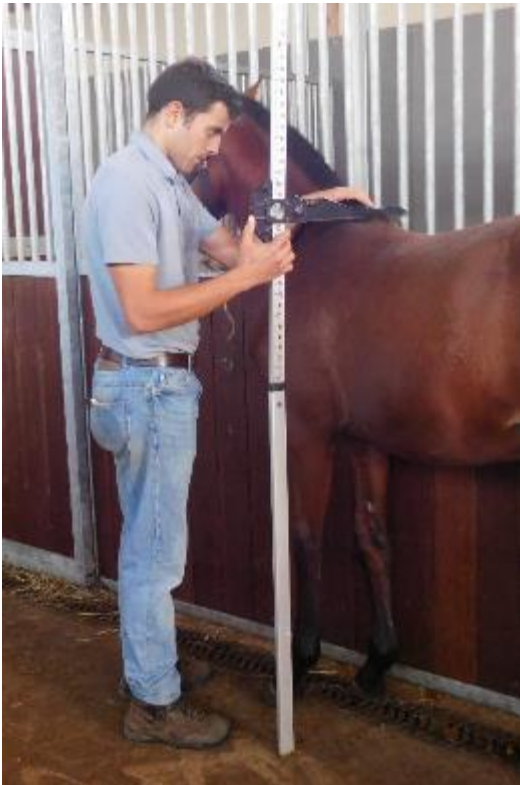


To study the influence of mare body conformation  
on growth and development of Lusitano foals,  
from birth to weaning.



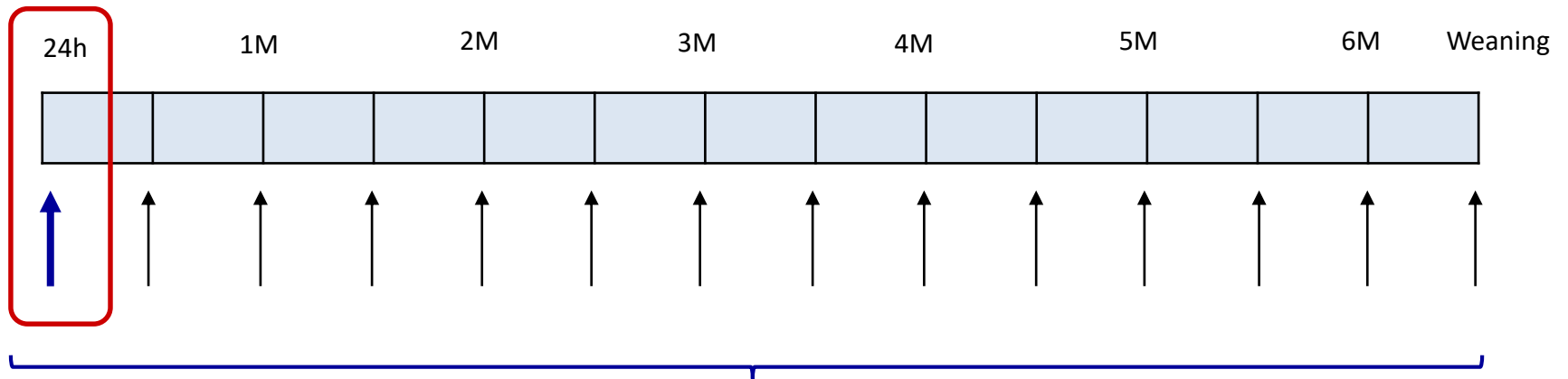
## Materials & Methods

- 50 Lusitano foals (26 colts and 24 fillies);
- Born in 2017 and 2018 – reference stud farm in the south of France;
- Periodically weighed and measured (height at withers, girth and cannon circumference).

**HW****G****BW****CC**

## Materials & Methods

- Monitored between birth (24h) and weaning ( $195 \pm 19.5$  days);
- Total of 2,552 records;
- All measurements were performed by the same operator.



Fortnightly intervals



# Materials & Methods

BW 504±48 kg  
HW 160±4 cm



Lusitano mares

AI



n=24



Lusitano foals  
Lusitano mares (biological)  
**(LM)**

BW 505±36 kg  
HW 161±5 cm



Lusitano mares  
(recipient)

ET  (Lus♀ x Lus♂)



n=17




Lusitano foals  
Lusitano recipient mares  
**(RLus)**

BW 575±33 kg  
HW 166±5 cm



Warmblood mares  
(recipient)

ET  (Lus♀ x Lus♂)



n=9



Lusitano foals  
Warmblood recipient mares  
**(R)**



## Materials & Methods



- Husbandry conditions and management were identical for all animals;
- Diets were adjusted according to different needs (INRA, 2012).

Statistical analysis (SAS Institute, 2017):

➤ **Mixed model** (repeated measures):

- group, year of birth, sex and their interactions - fixed factors;
- foals – random factor;
- Linear and quadratic effects of time were included in the model.

# Results & Discussion

## Body Weight

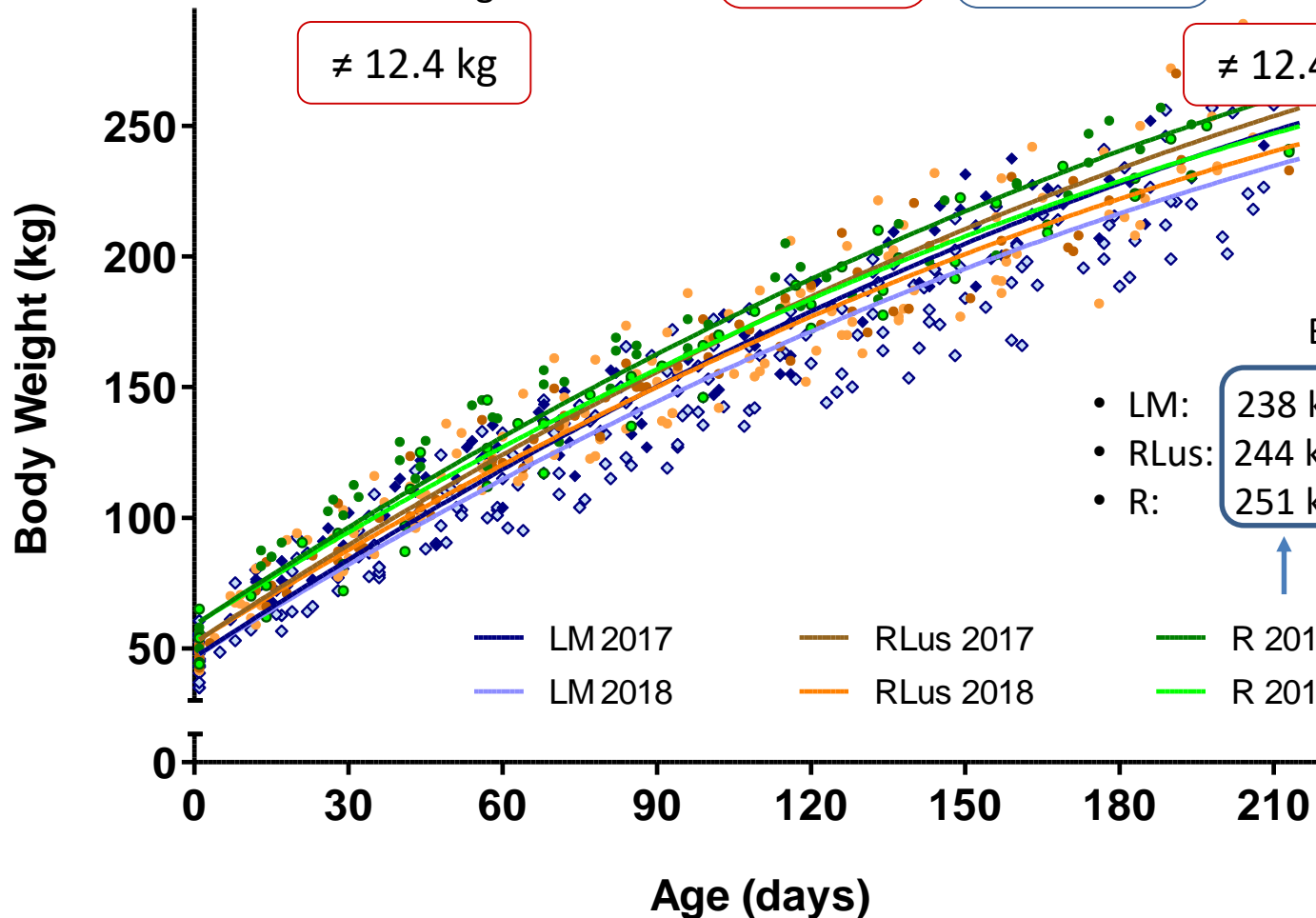
BW (birth):  
LM: 46.5 kg  
R: 58.9 kg

≠ 12.4 kg

Group  
P<0.05;

Year\*time  
P<0.001

Saddlebred foals –  
Draft mares  
No differences  
(180 d)  
(Peugnet *et al.*, 2014)



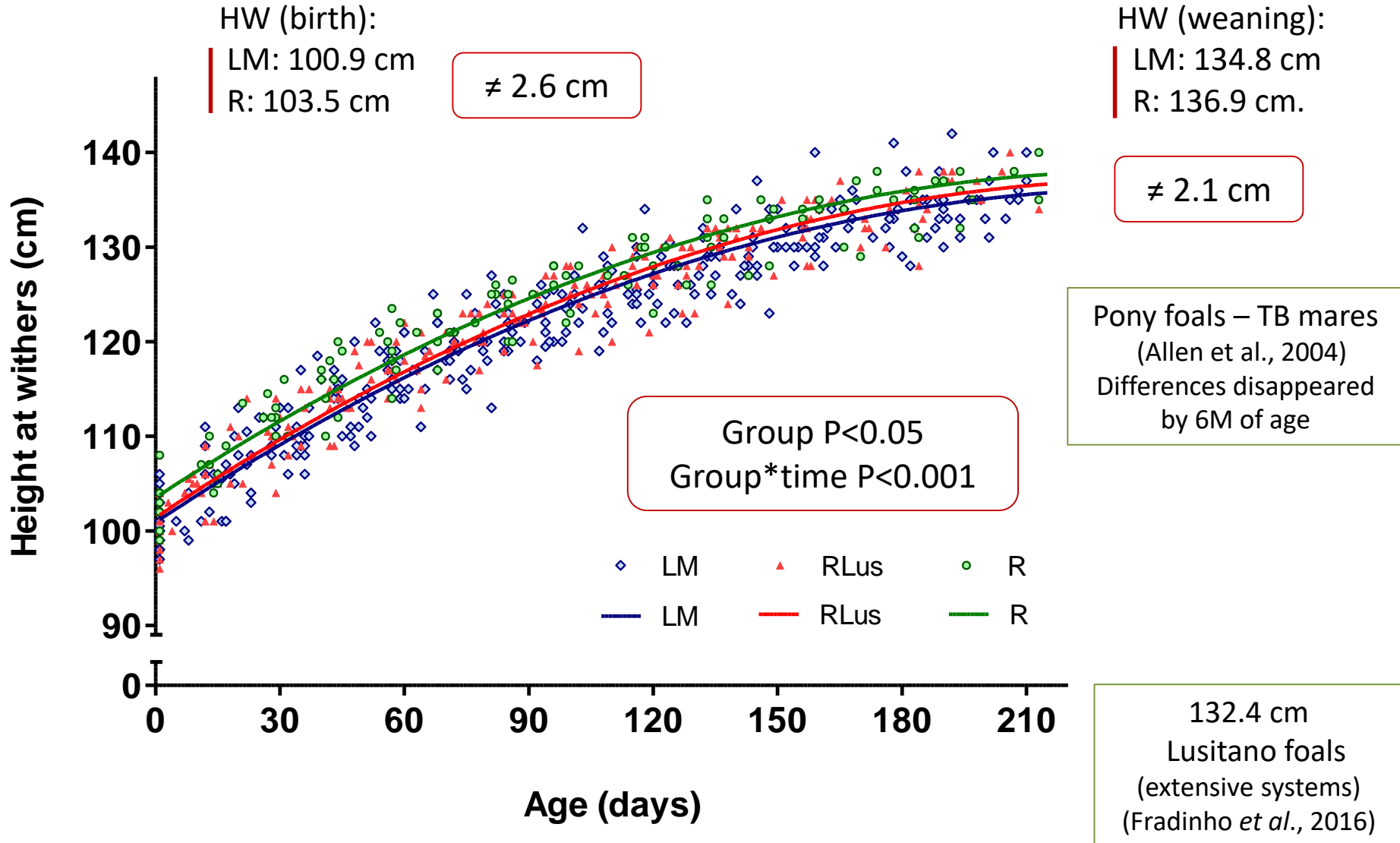
BW (weaning):

- LM: 238 kg (2017) vs. 226 kg (2018)
- RLus: 244 kg (2017) vs. 232 kg (2018)
- R: 251 kg (2017) vs. 238 kg (2018)

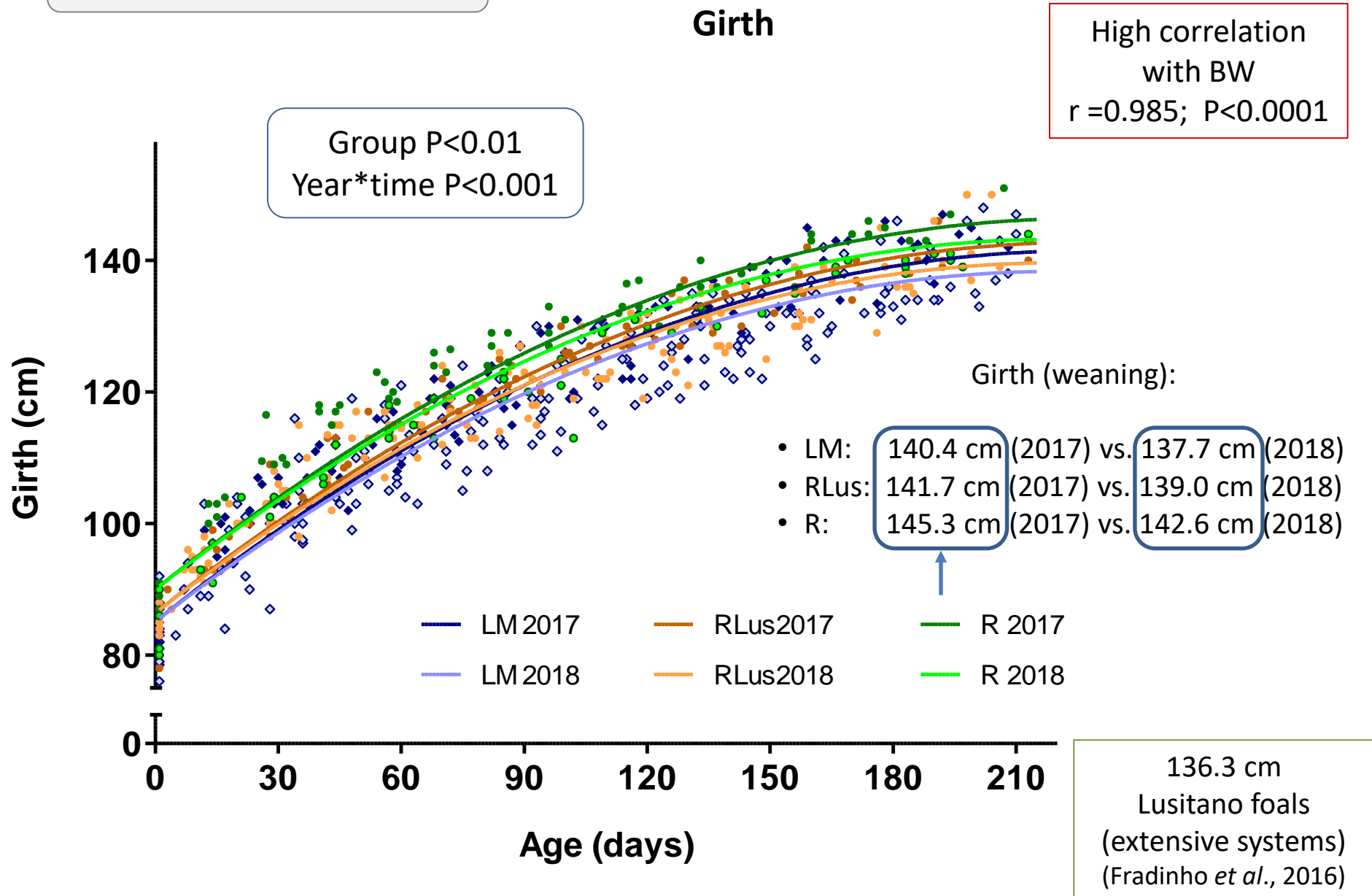
217 kg  
Lusitano foals  
(extensive systems)  
(Fradinho *et al.*, 2016)

# Results & Discussion

## Height at withers

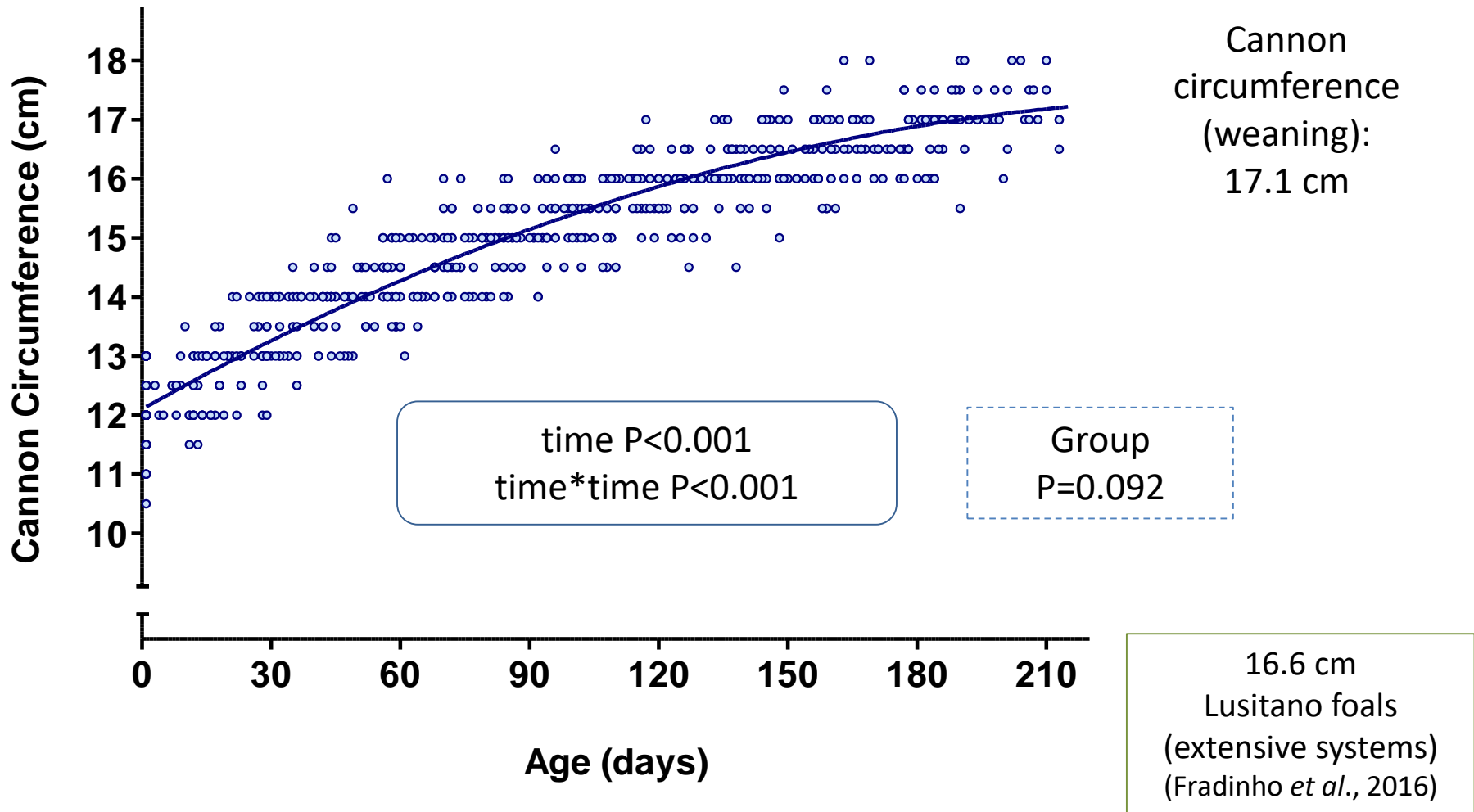


# Results & Discussion



# Results & Discussion

## Cannon circumference



## Conclusions

- Growth and development of Lusitano foals until weaning were influenced by the size of their dams;
- Innovative results for the Lusitano breed;
- Emphasizes the importance of an appropriate selection of recipient mares with regard to body shape and the inherent uterine capacity;
- Further studies should be extended to an older age in order to evaluate the overall impact on performance, and to assess the possible dilution of this effect over time.



**Thank you!**



**71<sup>st</sup> EAAP Meeting,  
Porto, Portugal - 31 Aug. to 4 Set. 2020**