

Currently and future prospects of individual animal data interpretation to optimize dairy goat farm management

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Dairy goat intensification

- Increase in efficiency and productivity
- So far, intensification has focused on:
 - Increasing number of animals per farm
 - Improvements in reproduction (AI)
 - Health programs
 - Milking automation
- Little improvements in farm management



Smart farming



Ancient shepherds

- Individual animal management
- Individual identification
- Filiation of individuals
- Relevant dates
- Productivity
- Selection based on productivity

ESKARDILLO





Data collection

Chip reader
Barcode reader
Digital camera
Keyboard for farmer inputs
Milk control
Morphological evaluation

Data Processing

Feedback to the farmer



Decision making based on big data

- Culling strategy
 - Low productivity (quantity / quality)
 - Reproductive and health problems
 - Old animals
- Selection of replacement animals
 - Genetic value
 - Morphology
 - Correct filiation
- Breeding strategy
 - Artificial insemination for high merit animals
 - Natural mating for low merit animals
 - Identification of the best conception timing



Objective: Evaluate the effectiveness of the ESKARDILLO on the management of conventional farms

Material and methods

12 farms WITH ESKARDILLO

- Murciano-Granadina breeding association
- Eskardillo implemented in 2014 (pioneers)
- Forward-thinking farmers
- Monitoring results from 2013 to 2016 (4 years). Using 2014 as reference
- Absence of sanitary problems or changes in farm management

12 farms without Eskardillo (CONTROL)

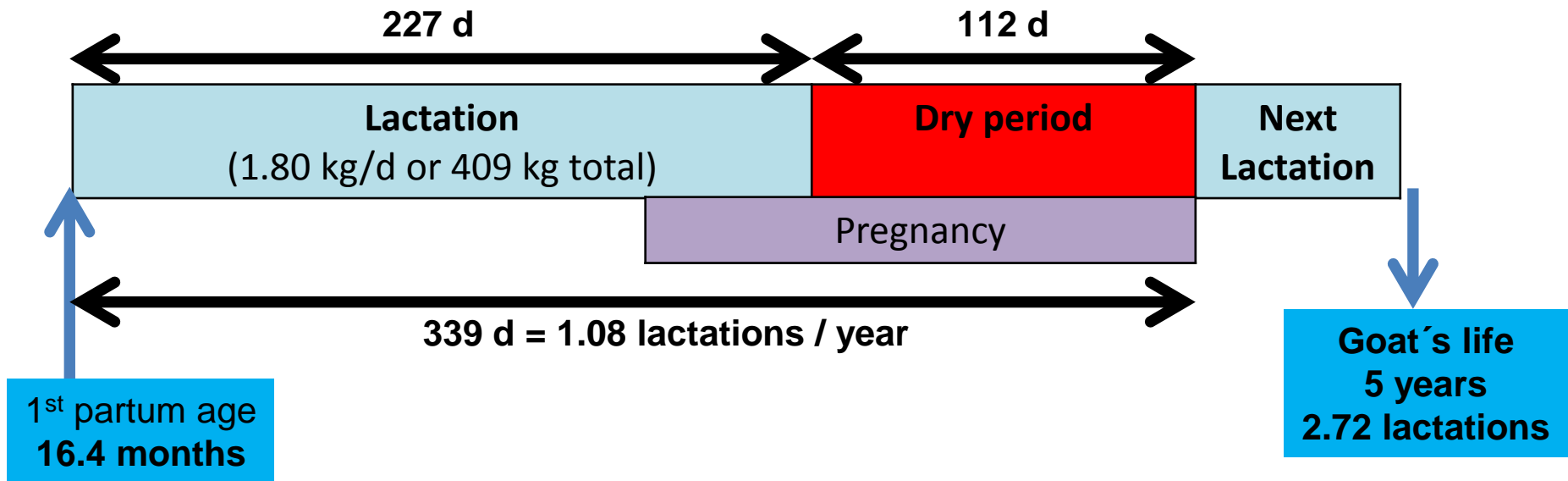
STATS: Farms as experimental units

Effects on

- Productivity
- Genetic progress
- Seasonality of production



Situation before ESKARDILLO (2013)



68,353 LACTATIONS; 31,859 GOATS

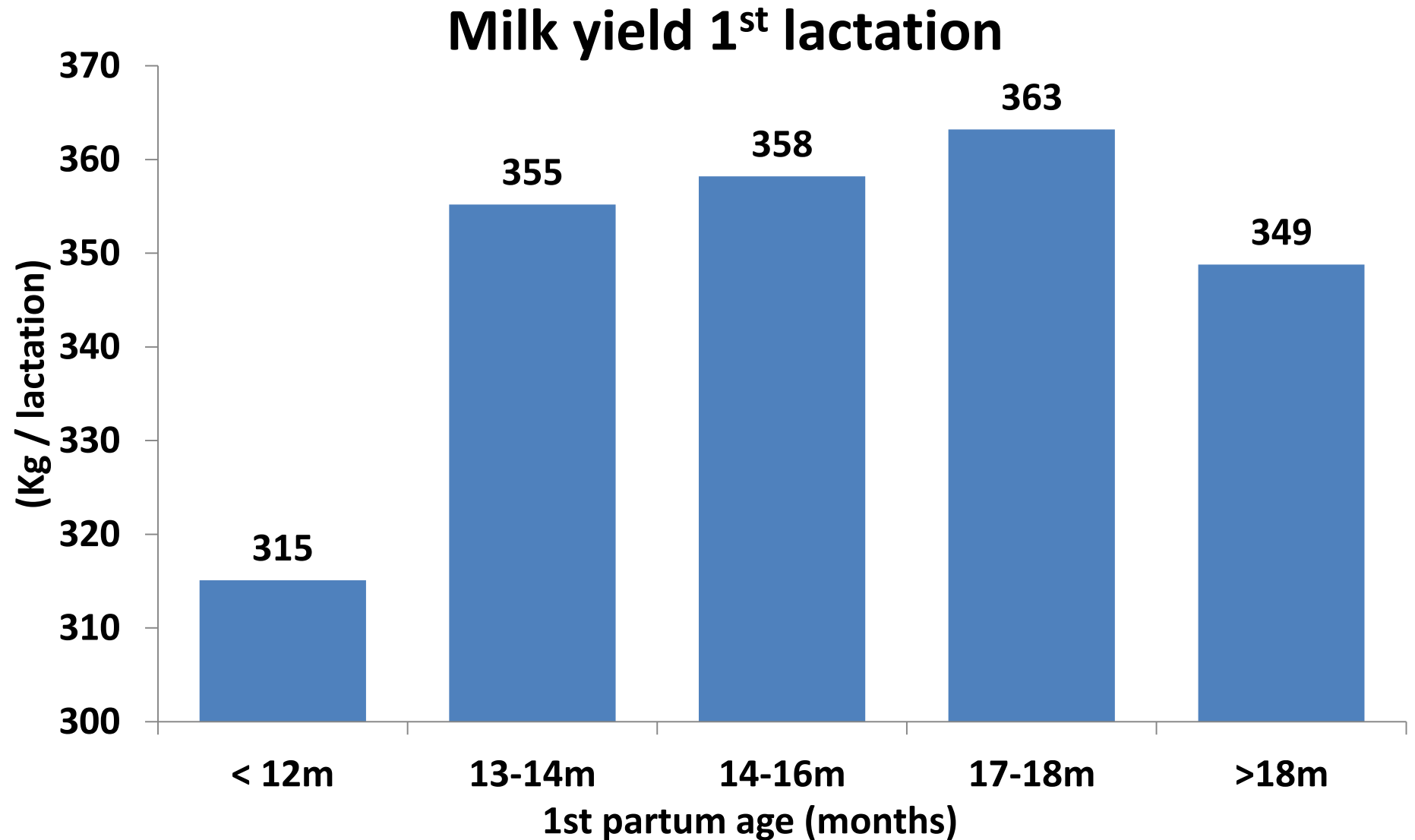
Optimizing farm management

- Decreasing unproductive periods

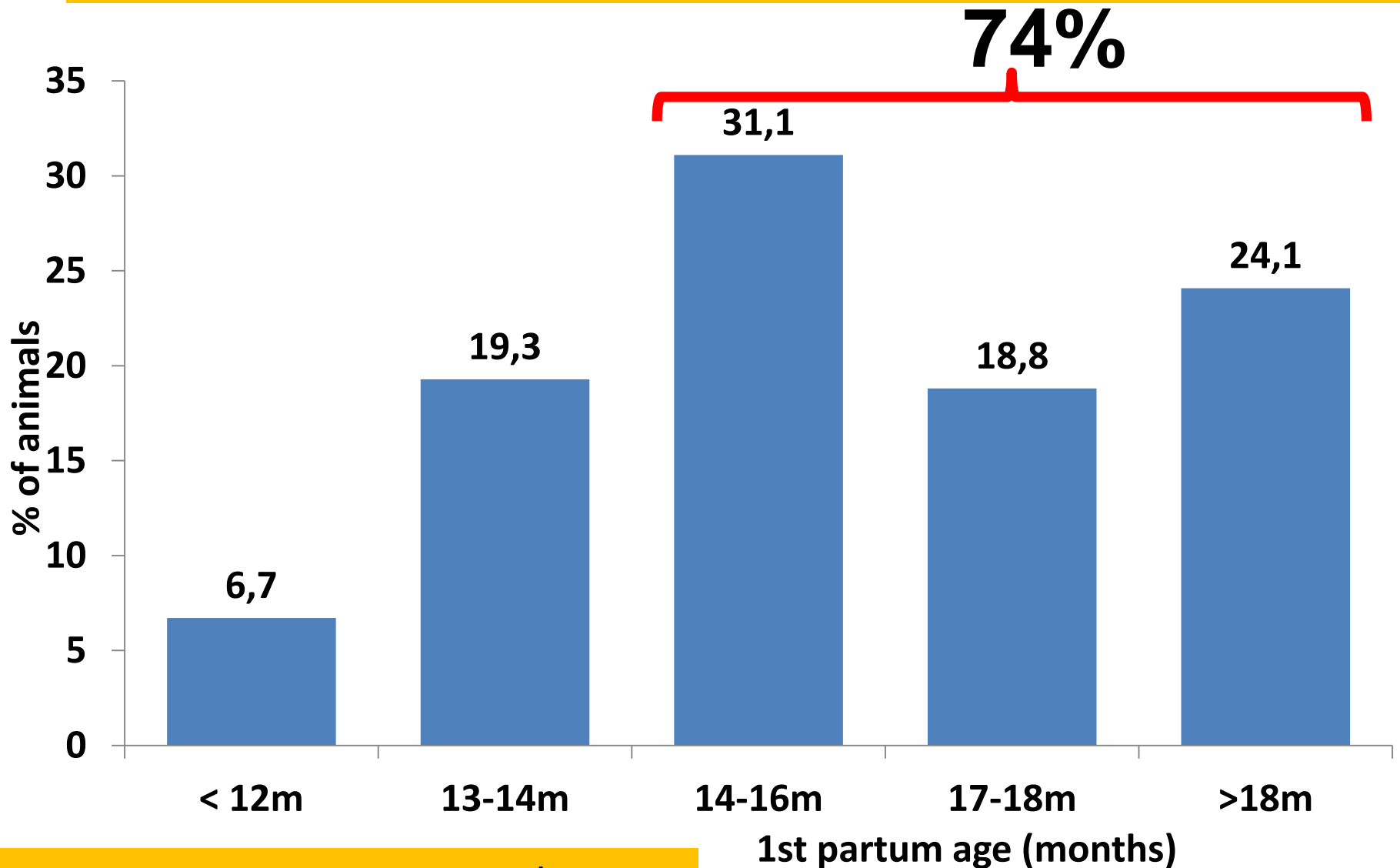
– 1st partum age

– Dry period length

Does 1st partum age affect milk production?

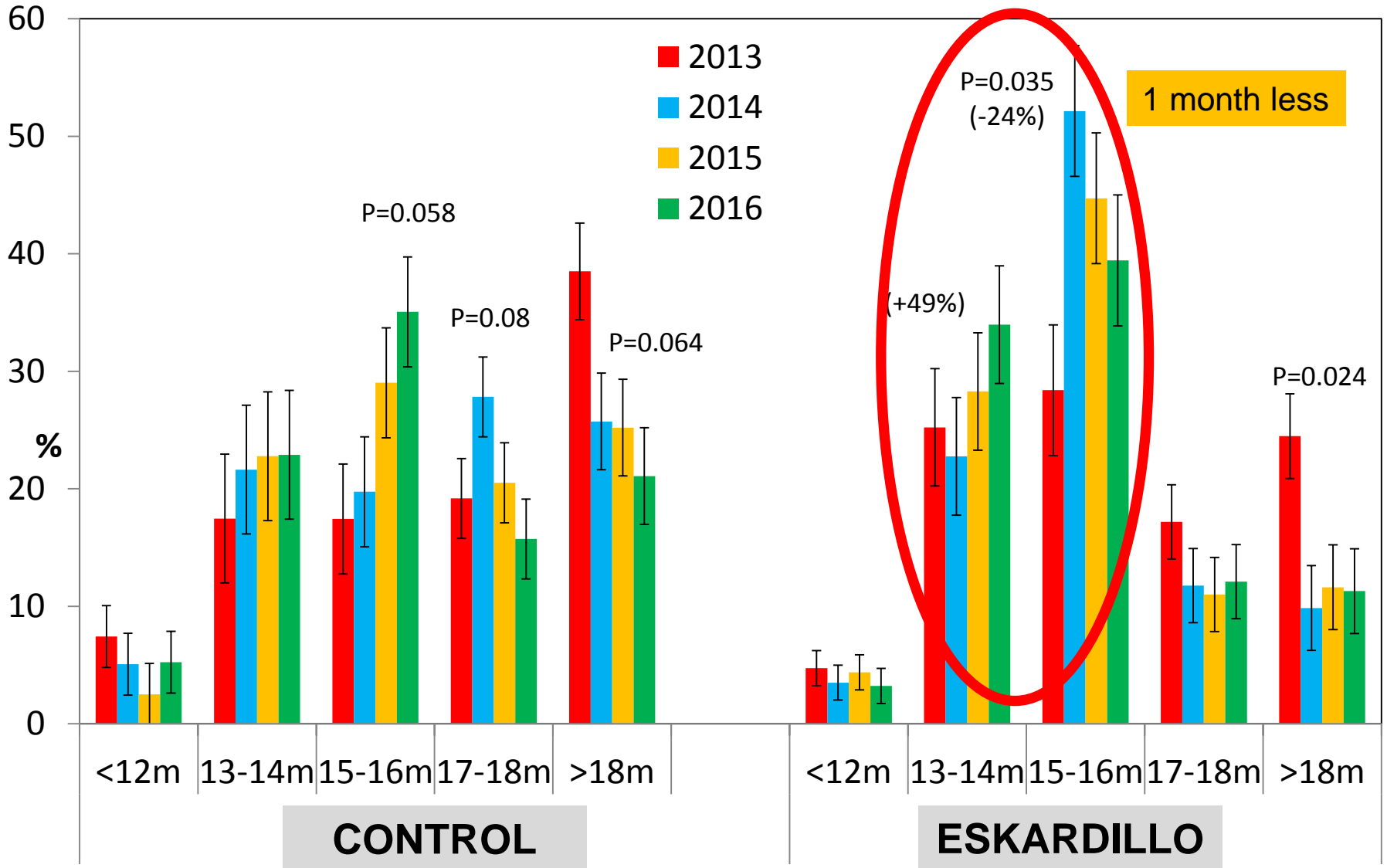


Implications of 1st partum age

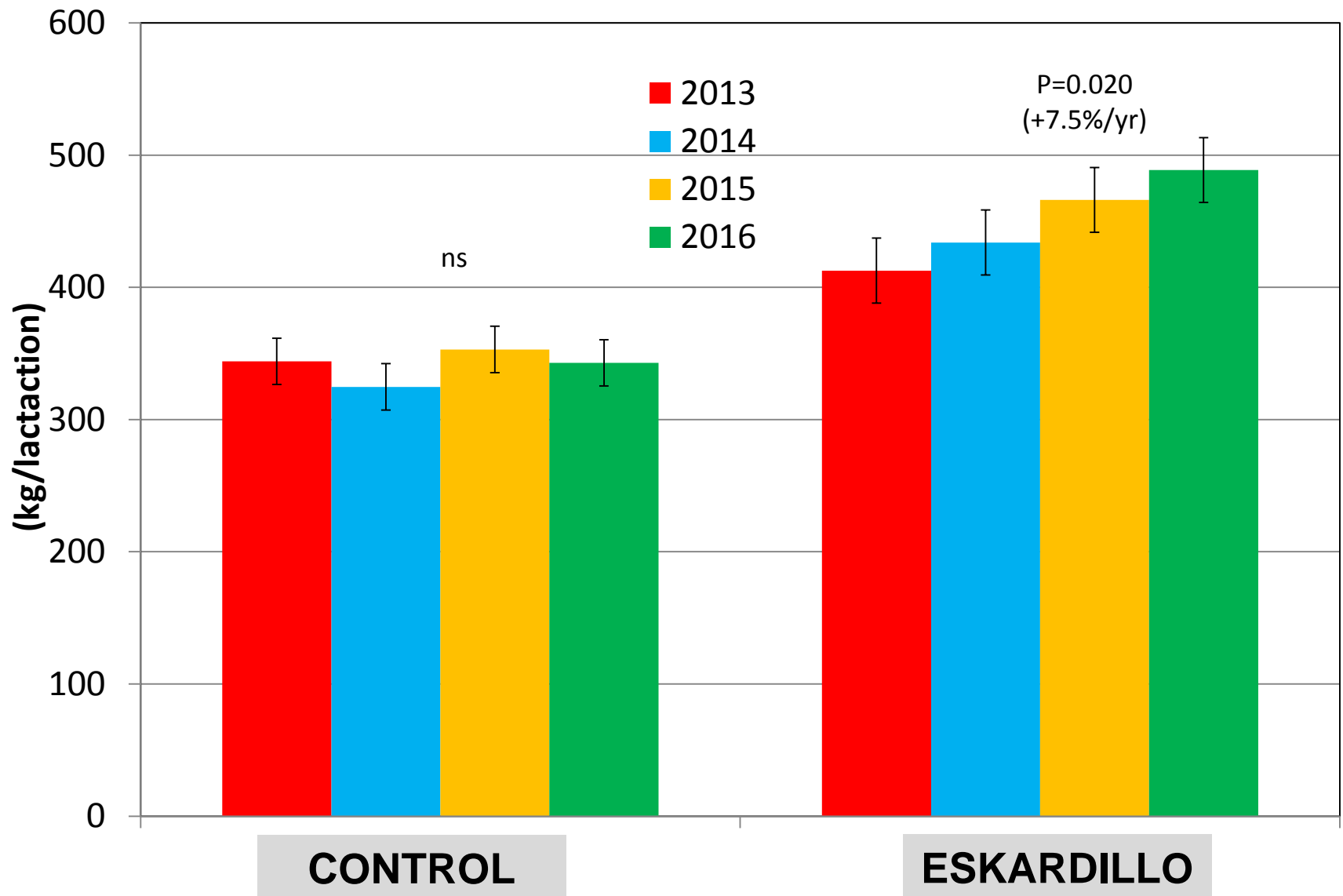


Extra feeding cost =12,1 €/animal

Effect of Eskardillo on 1st partum age

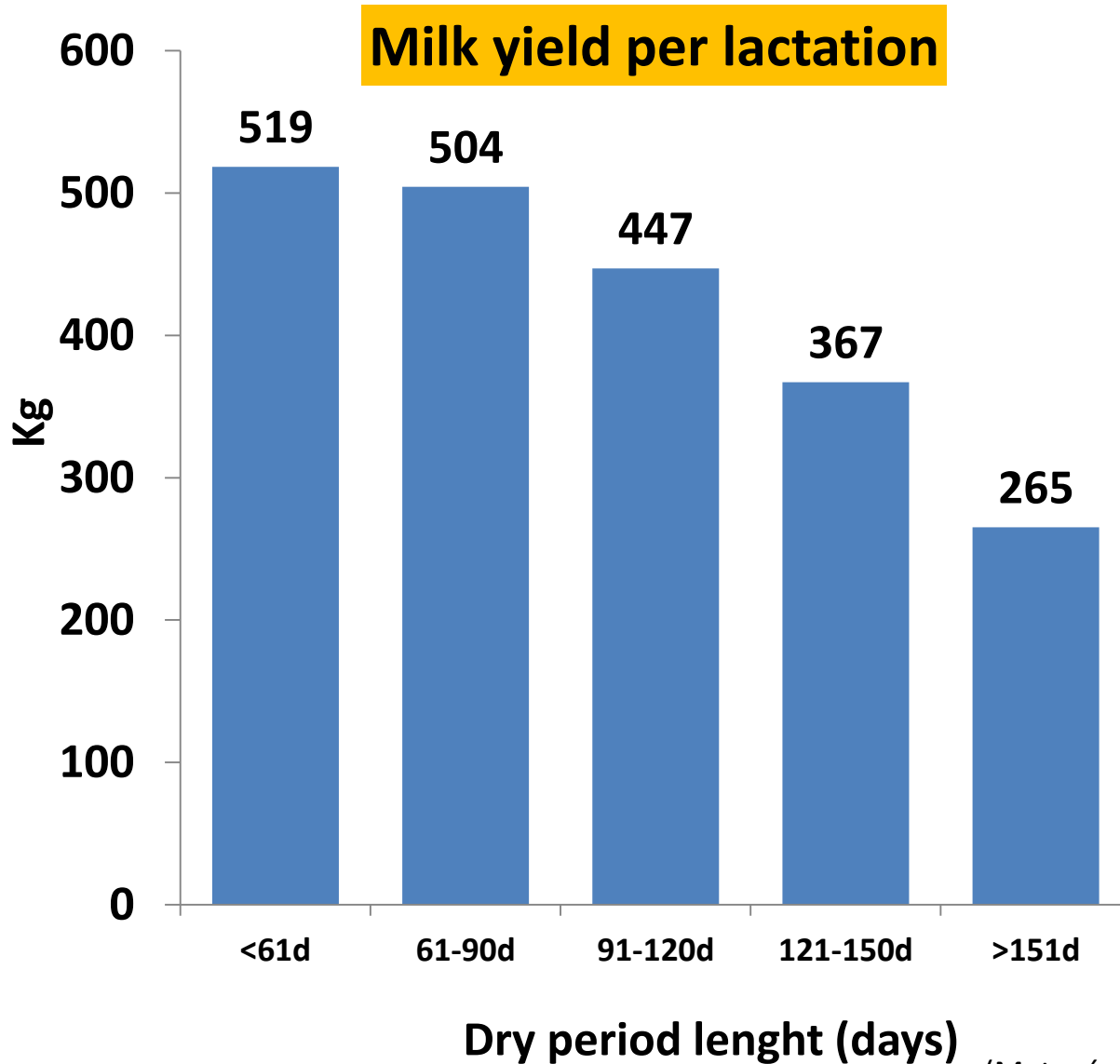


Milk production in 1st lactation

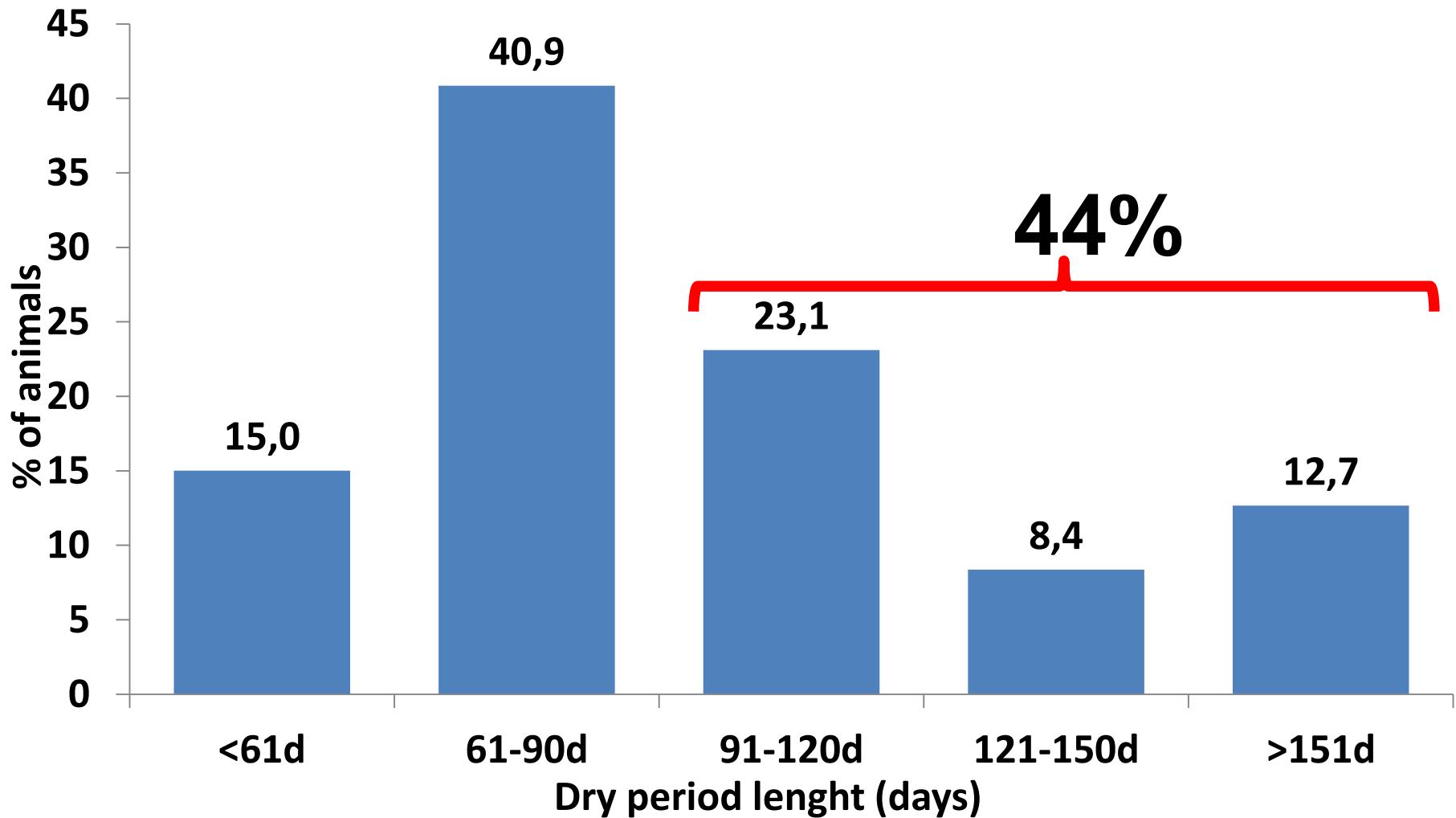


Dry period length

Does a long dry period increase milk yield?



Implications of dry period length



Extra feeding cost =16 €/animal

How long a lactation should be?

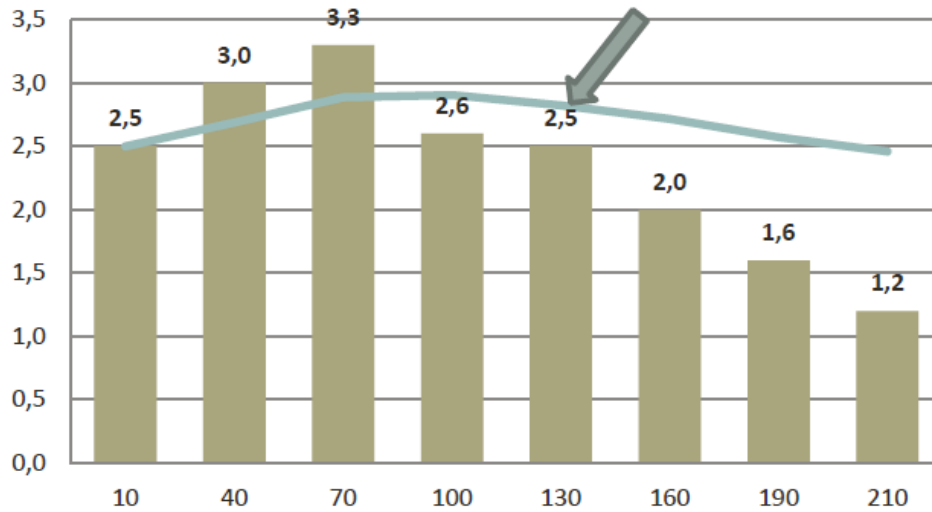
As long as you make money with it.
There is a profitability threshold.

Feeding cost	Milk price		
	0.4 €/L	0.6 €/L	0.8 €/L
0.40 €/d	1 L	0.67 L	0.5 L
0.50 €/d	1.25 L	0.83 L	0.62 L
0.60 €/d	1.5 L	1 L	0.75 L

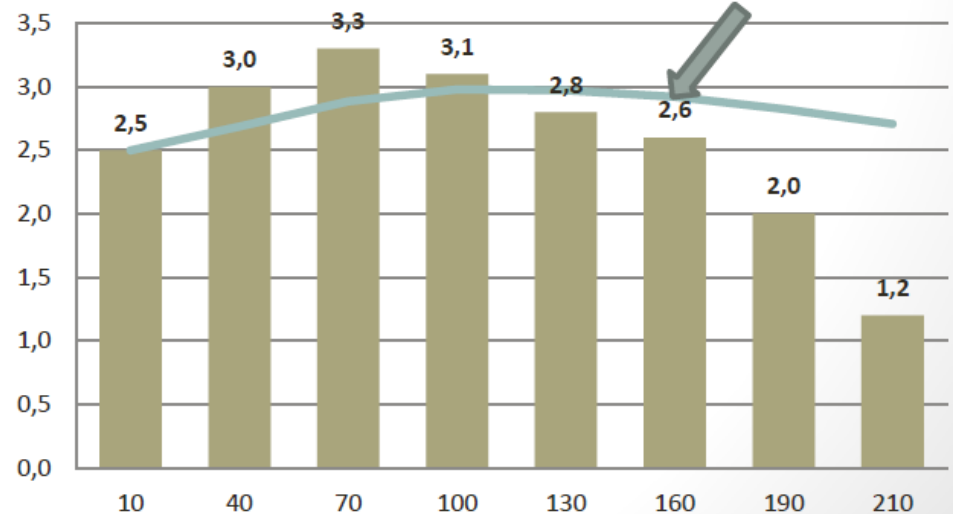
Below that threshold animals should be dry off
and give birth 2 months after

Eskardillo: Reproductive plan according to productivity

Lactation curve Type I

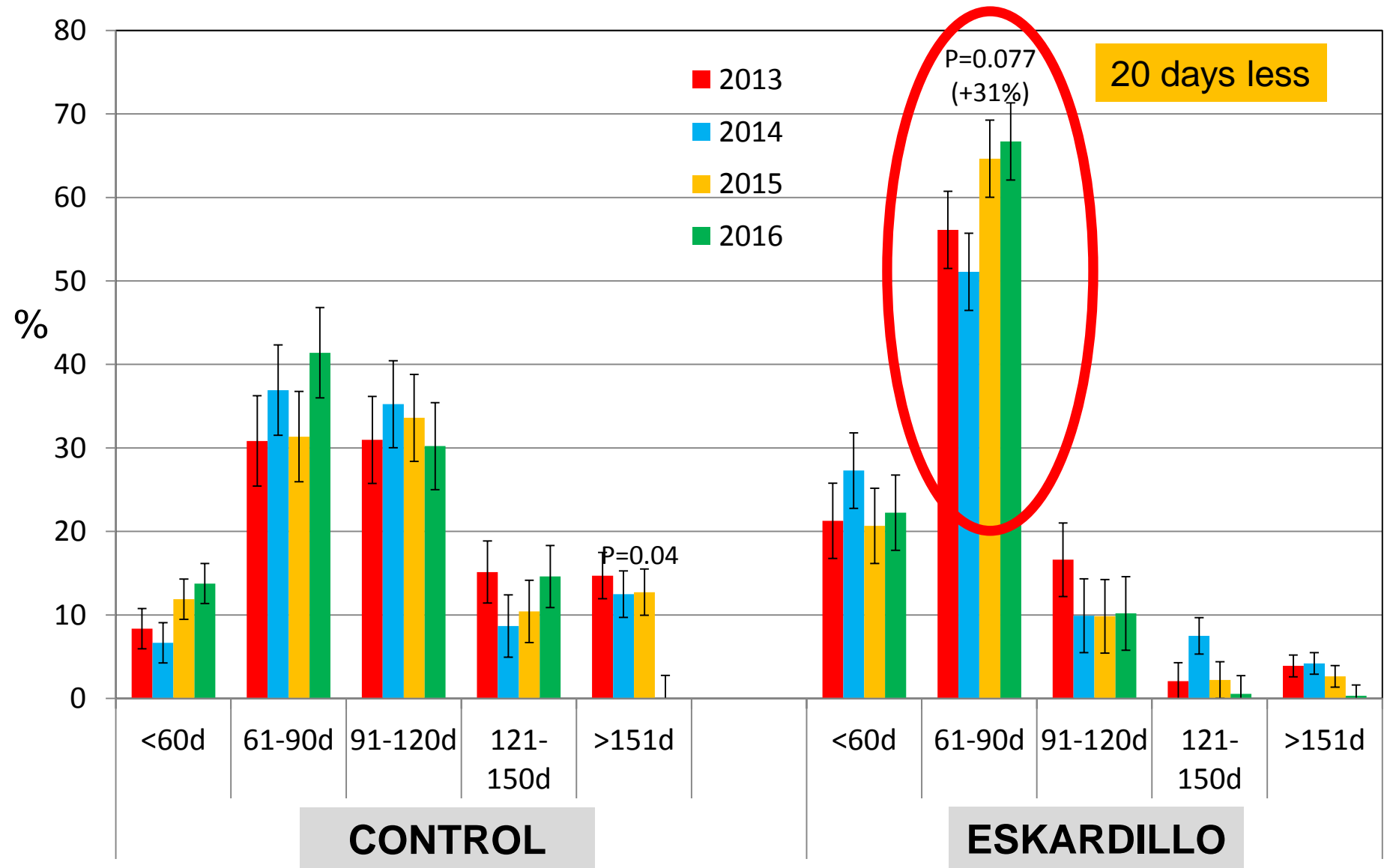


Lactation curve Type II

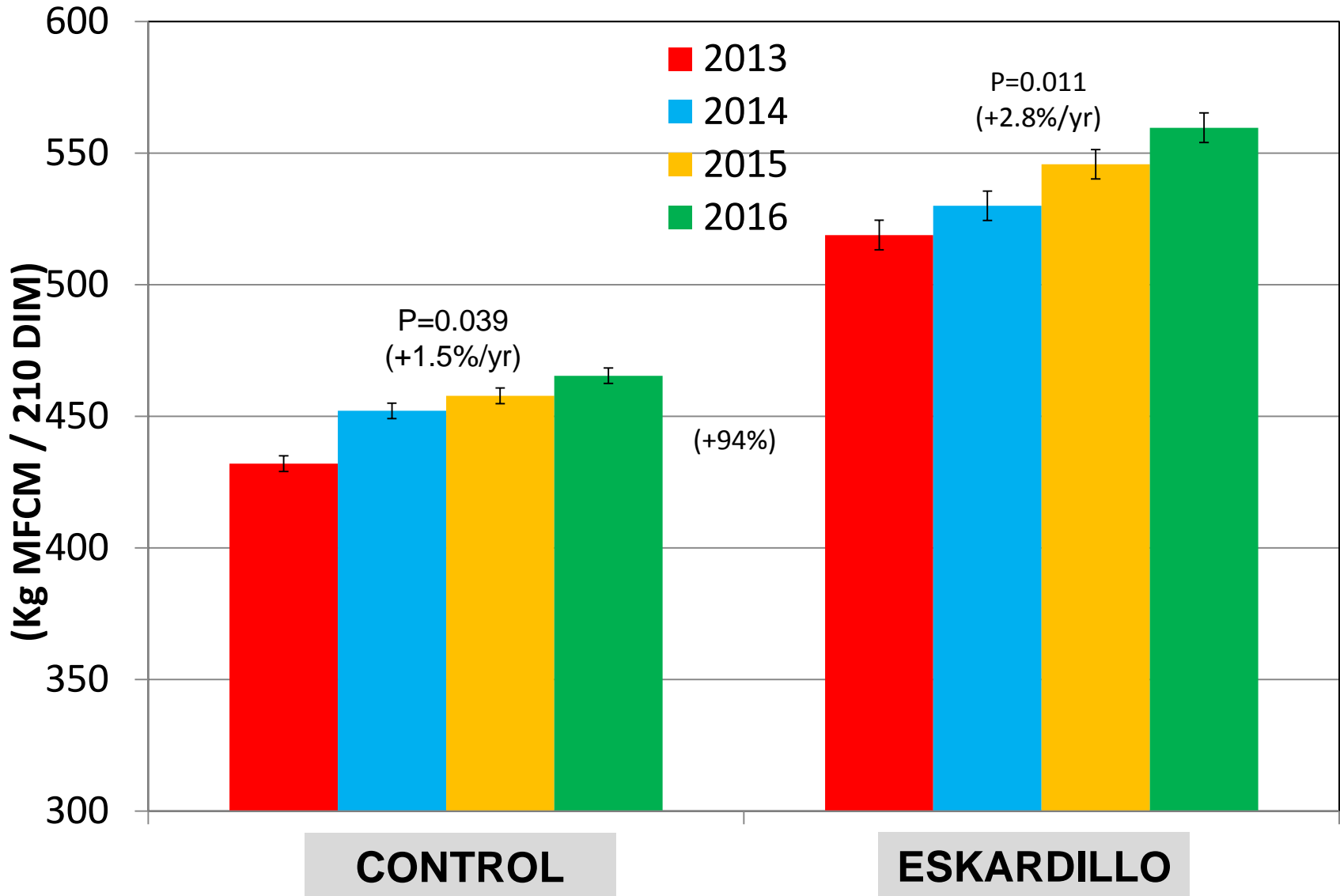


(Matec3n et al., 2013.
IV Foro Nacional Caprino)

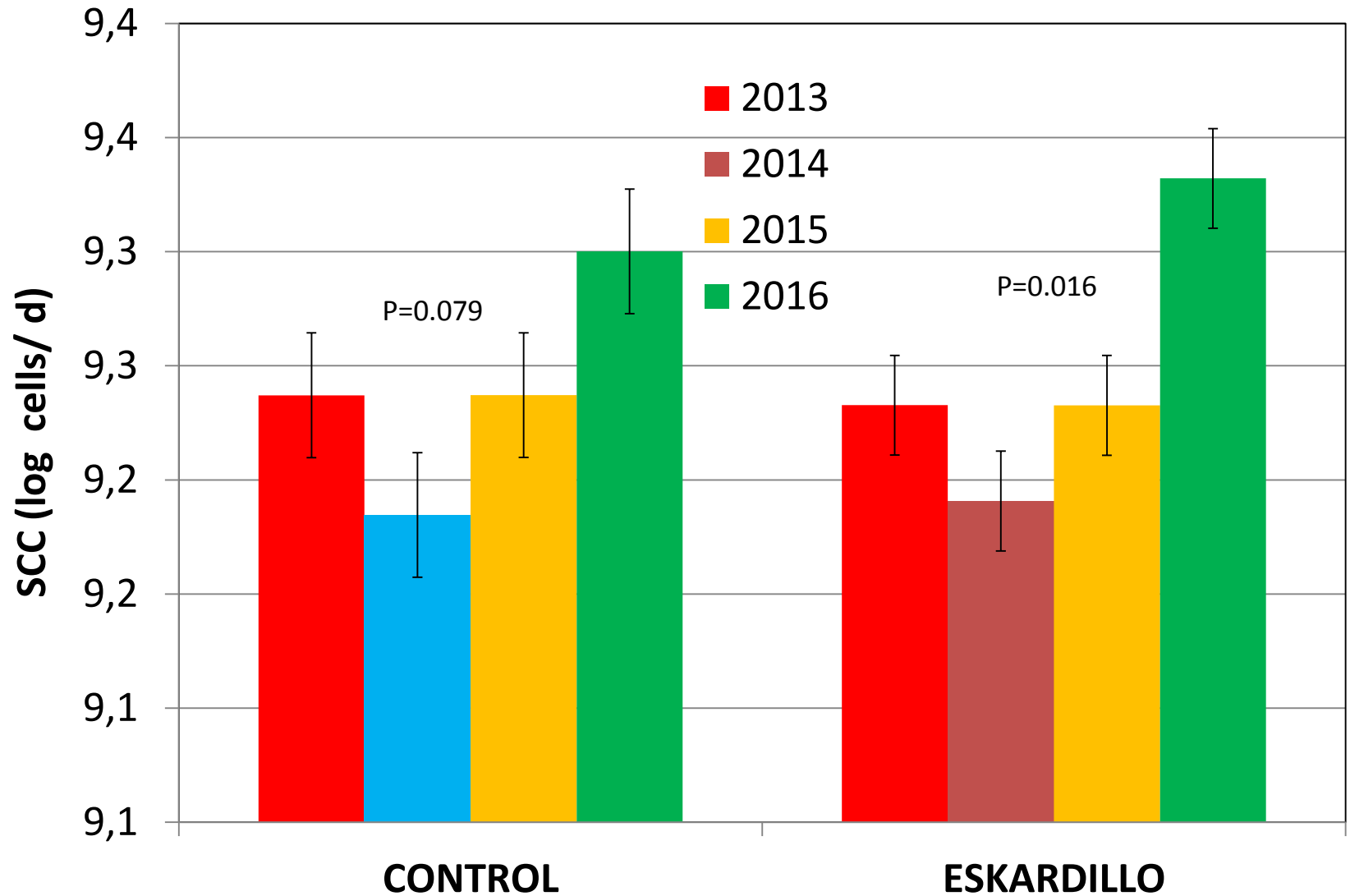
Effect of Eskardillo on Dry period length



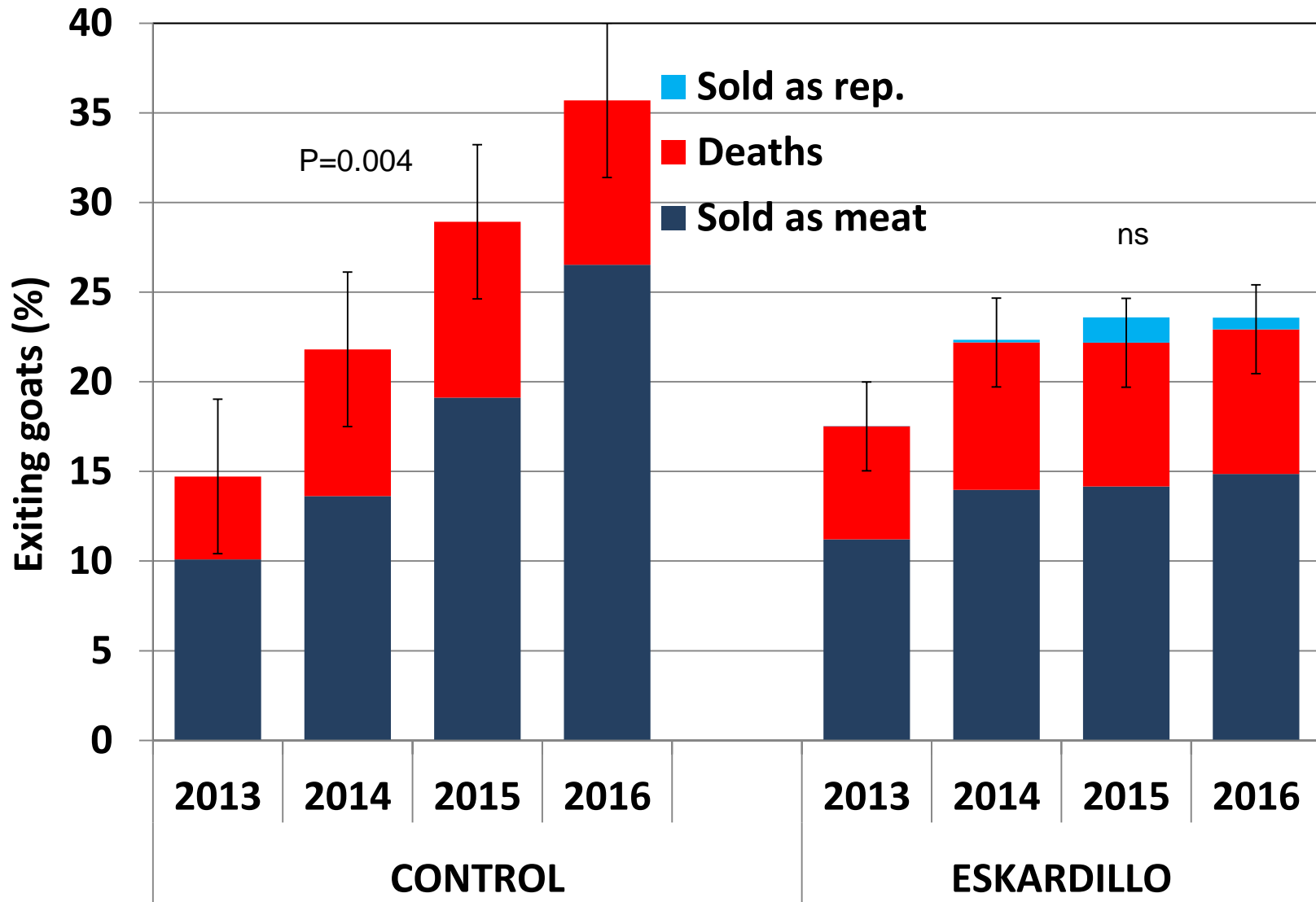
Effect of Eskardillo on Milk yield (210 DIM)



Udder health



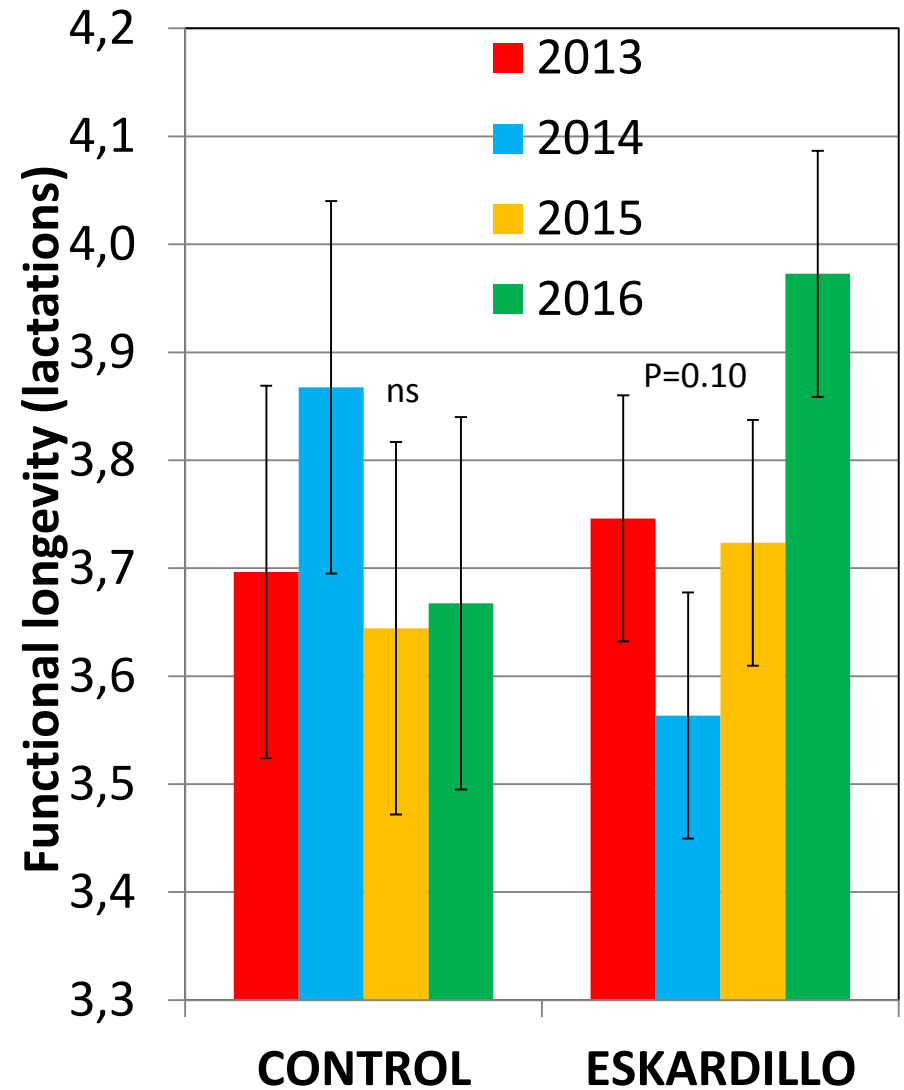
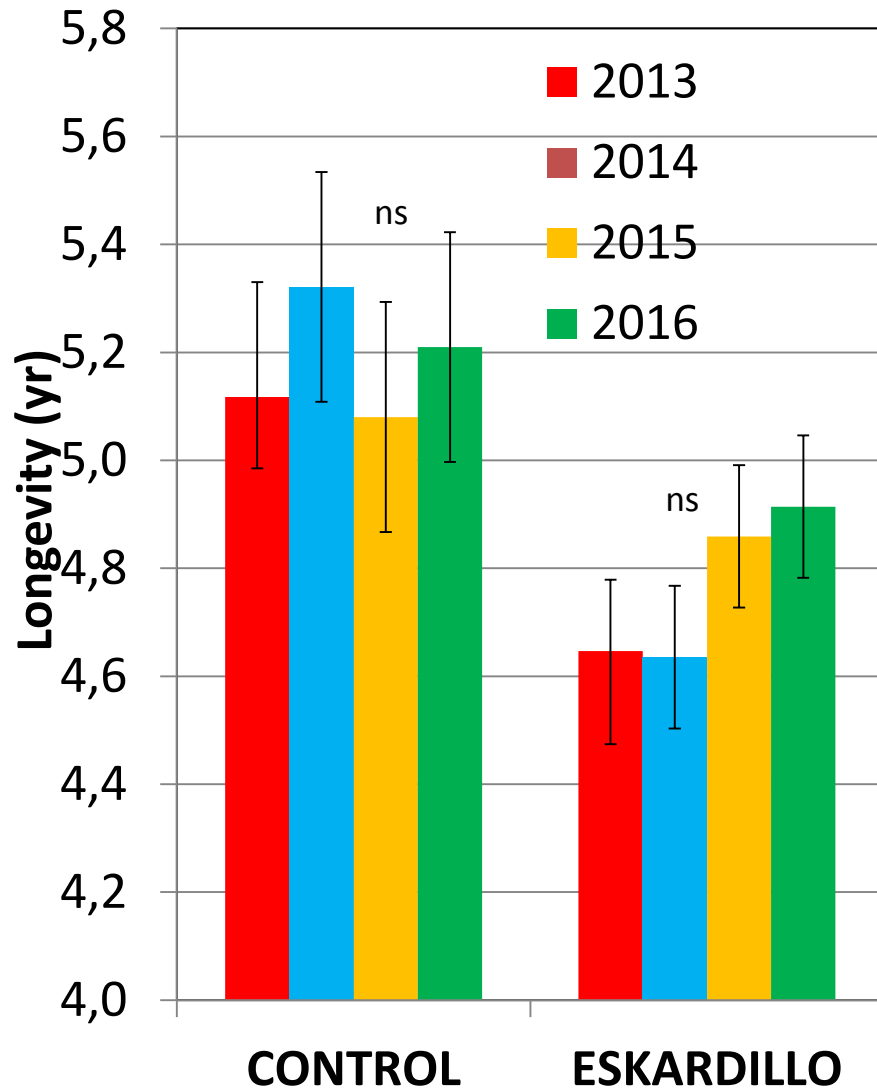
Culling strategy



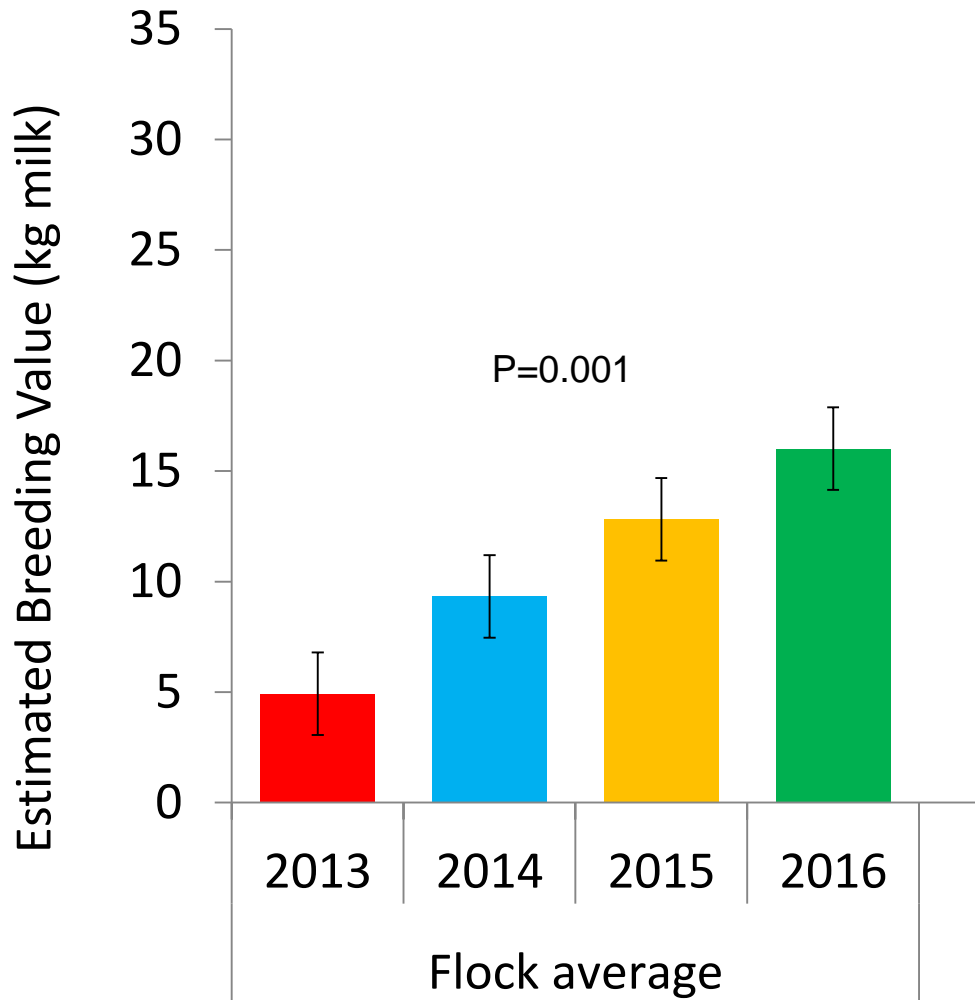
Longevity

/

Functional Longevity

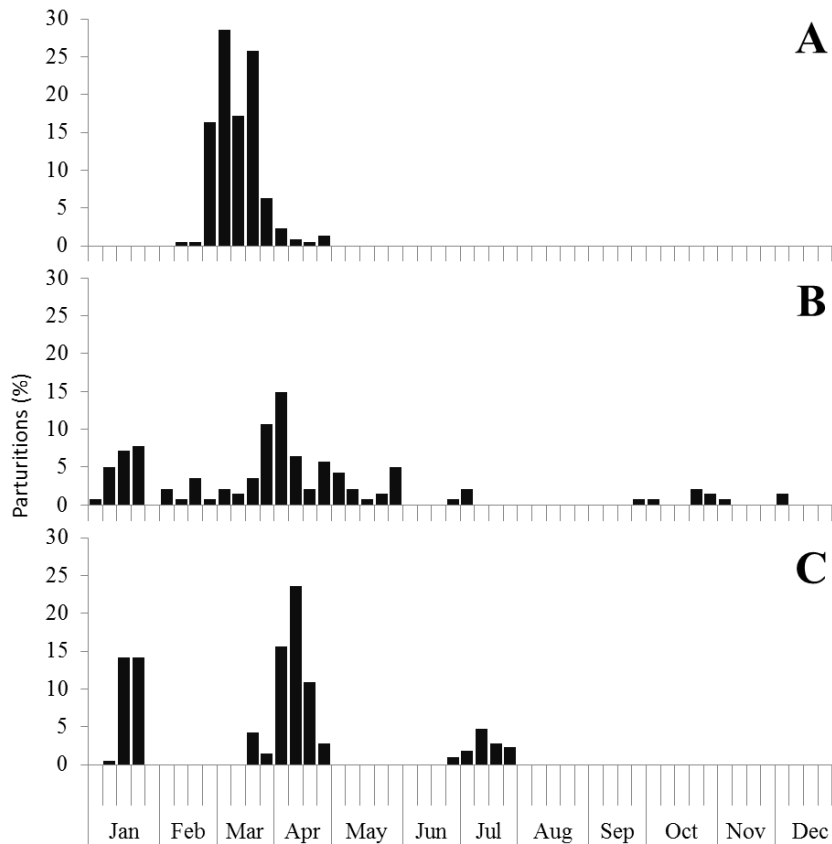


Effect of Eskardillo on Estimated Breeding Value

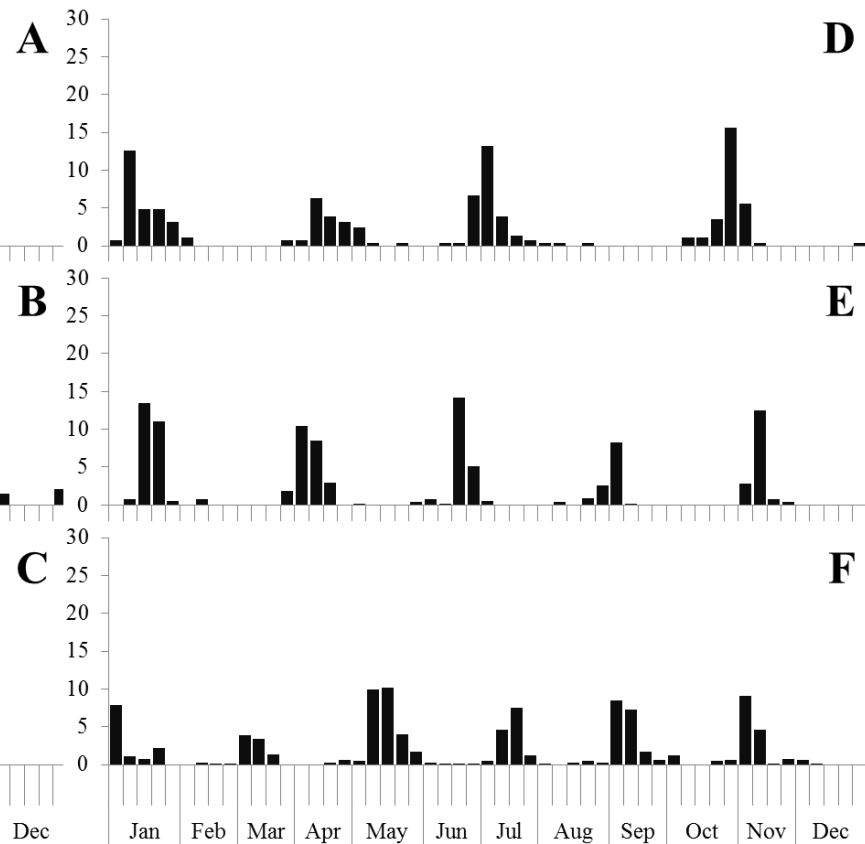


Reproductive plan (breeding seasons)

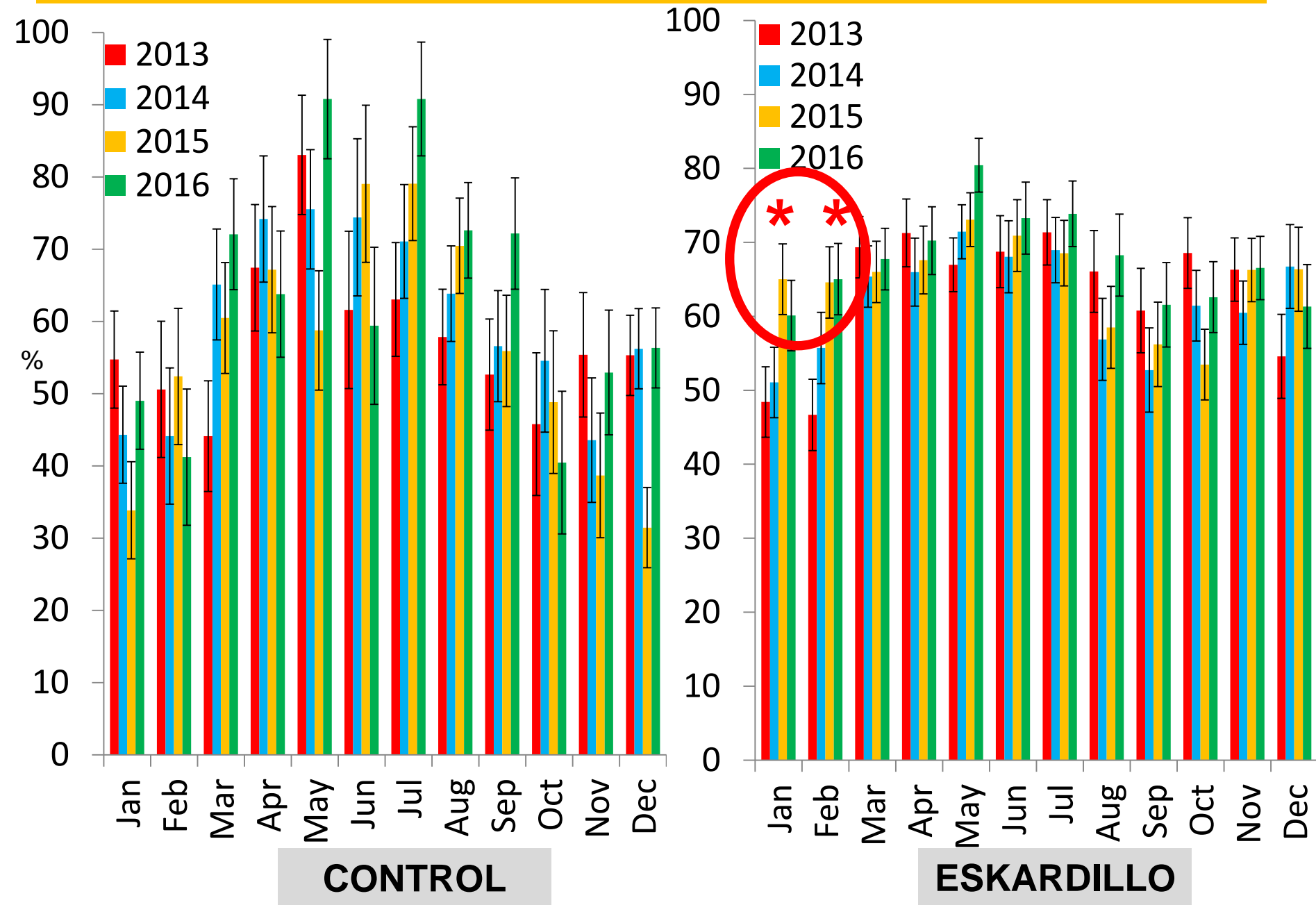
CONTROL



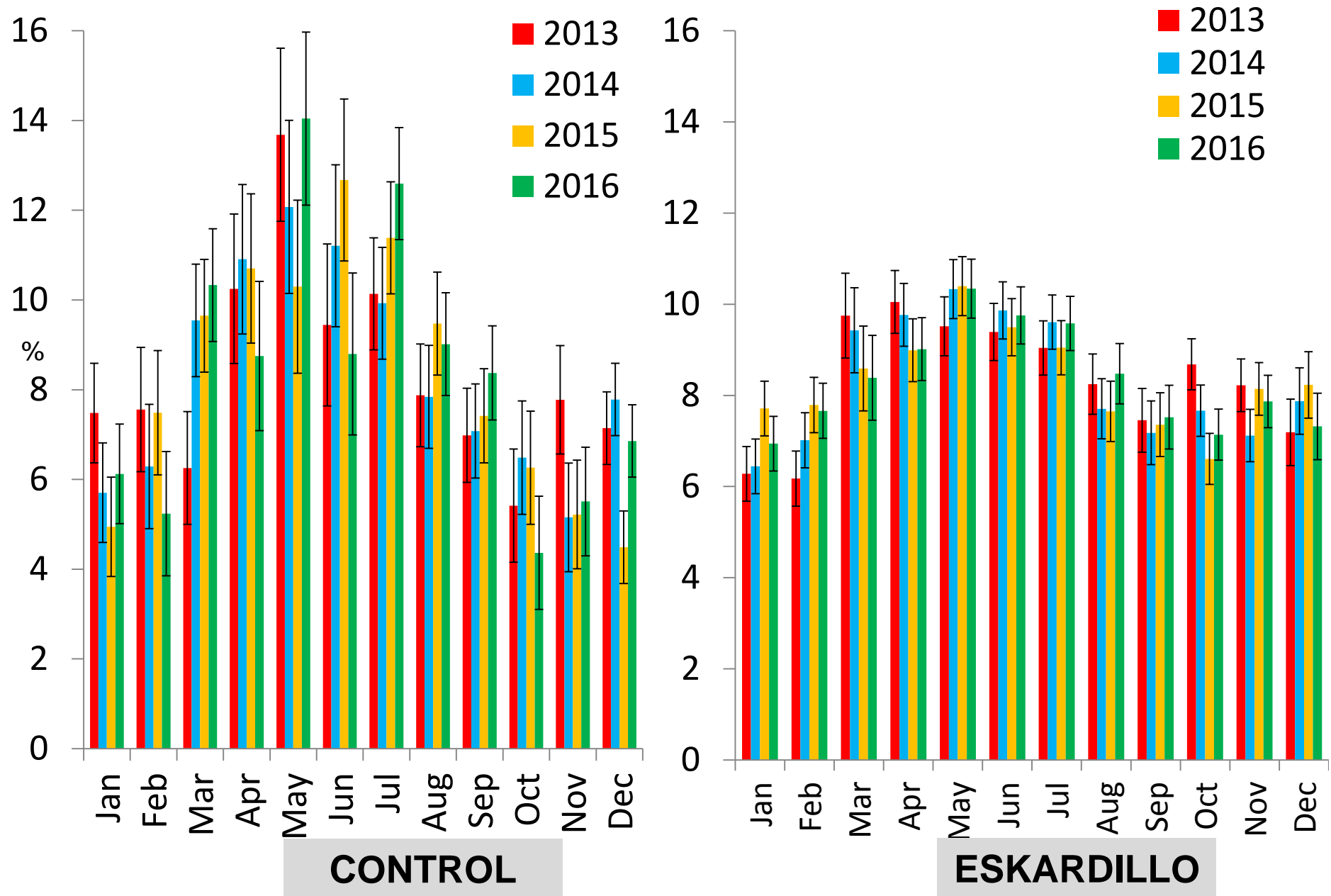
ESKARDILLO



Production seasonality (% of goats in milking)



Production seasonality (% of milk production)



Conclusions

This study demonstrated that farm management based on a data-driven decision making is a effective strategy to:

- **Decrease unproductive periods**
- **Improve milk production**
- **Decrease production seasonality**
- **Future plans:**
 - Precision feeding strategies
 - Economical indicators
 - Animal Health and Wellbeing indicators

Thank you for your attention



Innovation for Sustainable
Sheep and Goat
Production in Europe



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