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Session 24: Free communications on Sheep and Goat Production

Lactational and reproductive effects of melatonin in lactating dairy ewes mated during spring

(S.24, #2, p. 185)

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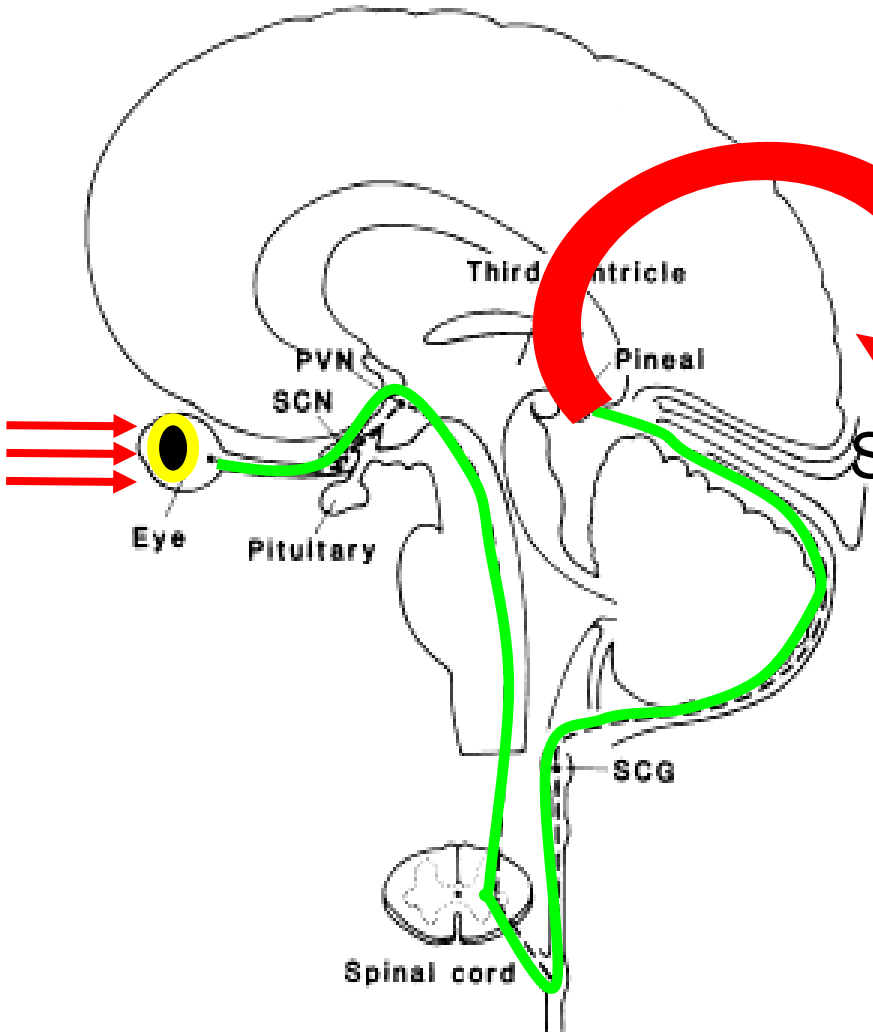
Introduction: Melatonin & Reproduction

Short day



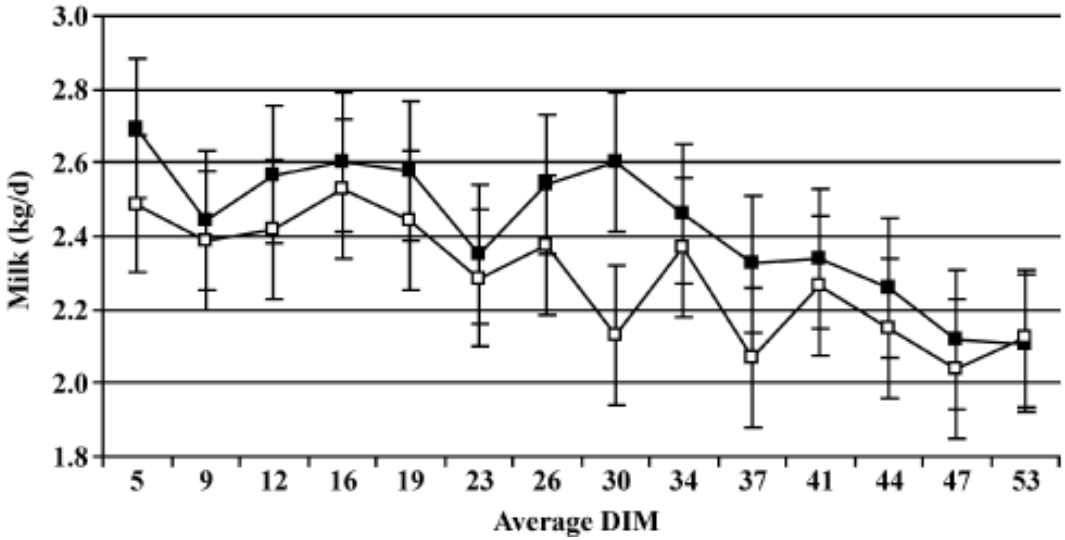
Serotonin → **Melatonin**

Resumption of reproductive activity

Introduction: Melatonin vs. Lactation

Long day photoperiod in lactation ⟶ Increases milk yield

Mikolayunas et al. (2008) dairy ewes with 8 vs16 h light during pregnancy (6 wk) and 12 h ligh during lactation: +6% in 51 d



- Feed intake ↑
- IGF-I ↑
- PRL ↑
- **Melatonin ↓**

Does melatonin have a negative effect on lactation?:

Via	Dose (mg/d)	Period (d)	Effect	Reference
Feeding	22.5	56	NS	Dahl et al.(2000)
S.C.	3.8	84	- 23%*	Auldist et al.(2007)

* Effect started to be significant after d 42

Objectives

To evaluate the effects of treating dairy ewes during lactation with melatonin implants on:

- **Lactational performance during the concurring lactation:**
  - Milk yield
  - Milk composition (fat & protein)
- **Reproductive performance at the next lambing:**
  - Conception rate (%)
  - Prolificacy (lambs/ewe)

Materials & Methods: 1/2

- **Animals:**

  A total of 110 lactating dairy ewes after the weaning of their lambs.

  - Manchega (n = 57)
  - Lacaune (n = 53)

- **Feeding:**

  Grazing (6 h/d) and complemented with a dehydrated forage mixture (1.03 UEL, 12.8% CP; as fed) ad libitum and concentrate at flat rate (0.4 to 0.8 kg/d).

- **Milking:**

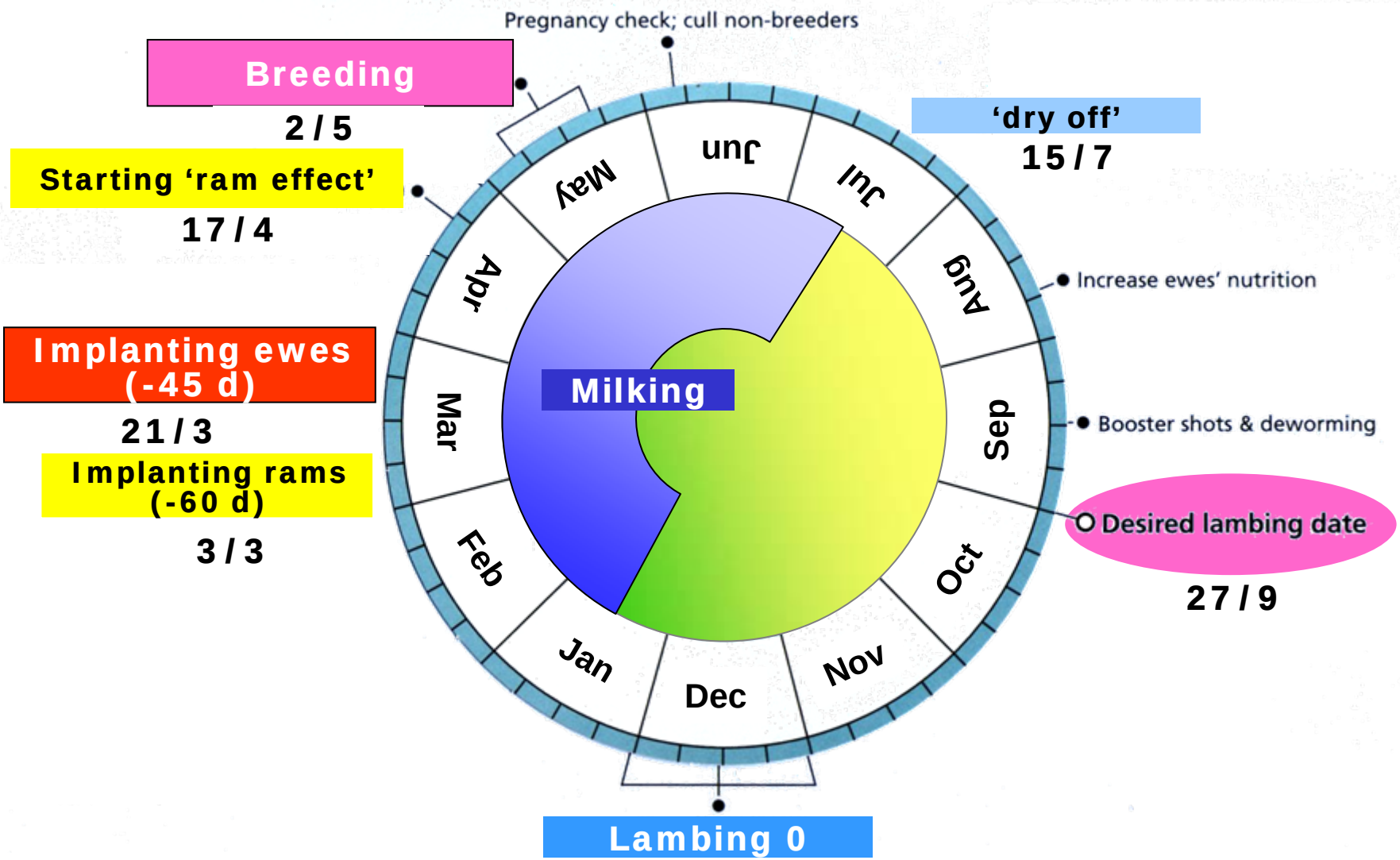
  Machine milked in a milking parlor 2×12 (Westfalia-Surge Ibérica) 42 kPa, 120 p/min, 50%) at 08:00 and 17:30 h

Materials & Methods: 2/2

- **Treatments:** Melatonin slow release implants (Melovine 18 mg/ewe, Ceva, Barcelona) s.c. implanted in the ear base.
  - Rams (n = 10): 3 implants, 60 d before mating.
  - Ewes (n = 110):
    - **Melatonin (M):** 1 implant, 45 d before mating (n = 55).
    - **Control (C):** Without implant (n = 55)
- **Mating management:** Free mating in groups (1 ram /12 to 15 ewes) during 90 d. Previous 'ram effect' (10 d).

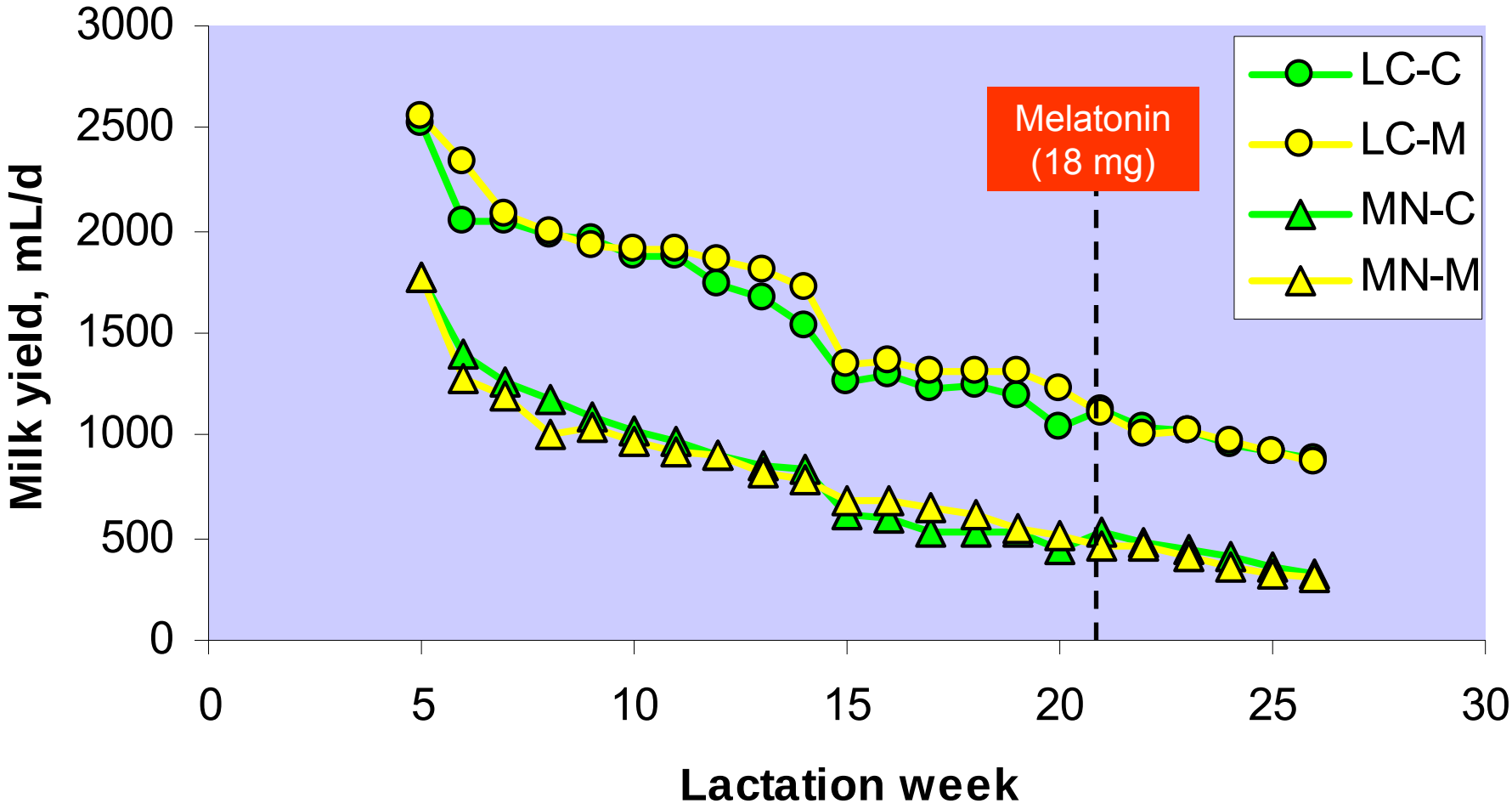
- **Statistical Analysis:** SAS (v. 9.1)
  - PROCMIXED for repeated measurements
  - X^2 for conception rate.

Flock management plan for the changing lambing season in lactating dairy ewes



Results: 1/5

Milk yield in Manchega (MN) and Lacaune (LC) dairy ewes according to treatments: Ccontrol (C) vs. Melatonin (M)



Results: 2/5

Lactational performance of dairy ewes treated with or without Melatonin during milking

Item	Lacaune		Manchega	
	Control	Melatonin	Control	Melatonin
Ewes, n	27	26	28	29
Milk yield[1], L	237	227	117	120
Fat, %	7.01	7.22	8.67	8.90
Protein, %	5.08	5.13	5.61	5.71

[1]Milk yield for 150 d after weaning (only for conceiving ewes).

Non significant differences ($P > 0.05$)

Results: 3/5

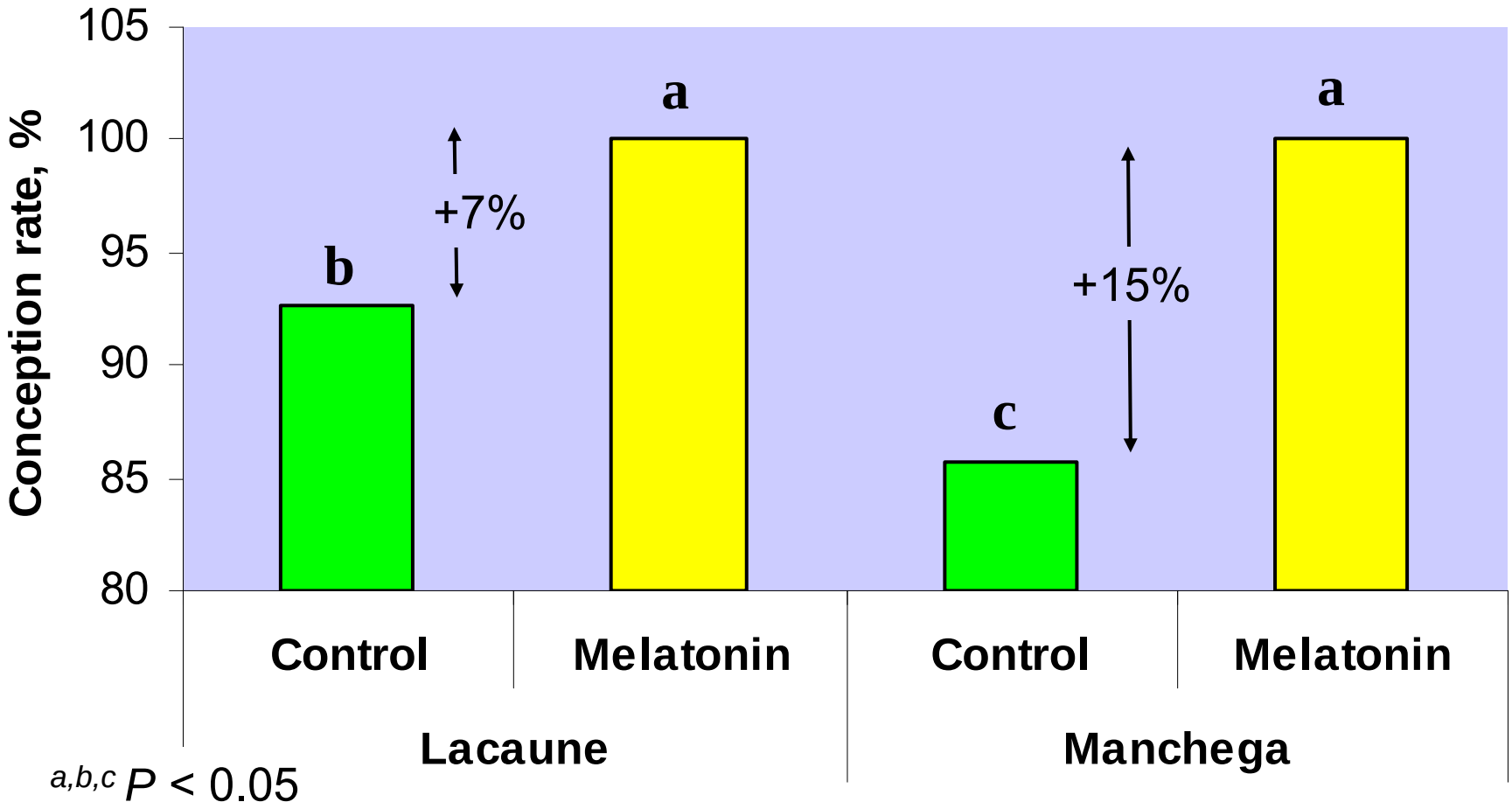
Reproductive performance of dairy ewes treated with or without Melatonin during milking

Item	Lacaune		Manchega	
	Control	Melatonin	Control	Melatonin
Ewes, n	27	26	28	29
Fertility, %	92.6[b]	100[a]	85.7[c]	100[a]
Prolificacy, L/e	1.92	2.00	1.75	1.83
Lamb BW, kg	3.60	3.29	3.99	3.98
Mortality,%	8.3[a]	2.0[b]	4.8[b]	1.8[b]

[a,b,c] $P < 0.05$

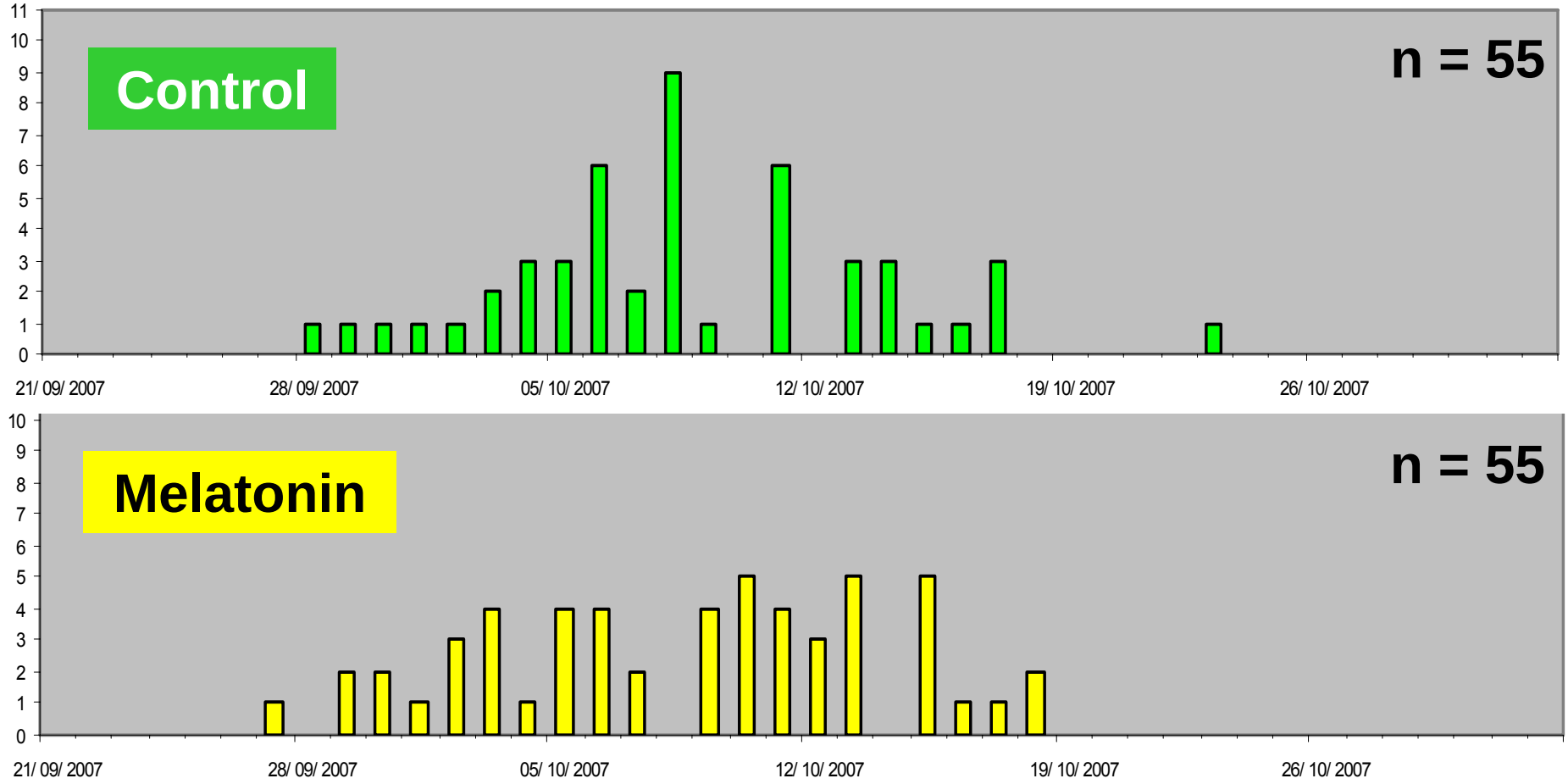
Results: 3/3

Conception rate of Manchega and Lacaune dairy ewes treated with or without Melatonin



Results: 2/5

Lambing distribution of dairy ewes according to treatments (27/9 to 24/10)



Lambing date

Conclusions

- **No lactational effects were detected for melatonin treatment at late lactation in spring.**
- **Melatonin increased conception rate by 7% and 15% in Lacaune and Manchega dairy ewes, respectively, without effects on prolificacy.**
- **Use of melatonin in dairy ewes was very effective to improve reproductive performance in out-of-season conditions.**

Thanks for attention!