Nutritional and lactational responses of nulliparous ewes induced to lactate according to breed and treatment protocol

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INTRODUCTION

Little information is available on lactation induction of dairy ewes in which lactation success and milk yield vary widely according to treatment, breed and season (20 to 100%). There is not a standardized protocol for lactation induction in sheep and their side-effects are poorly known.

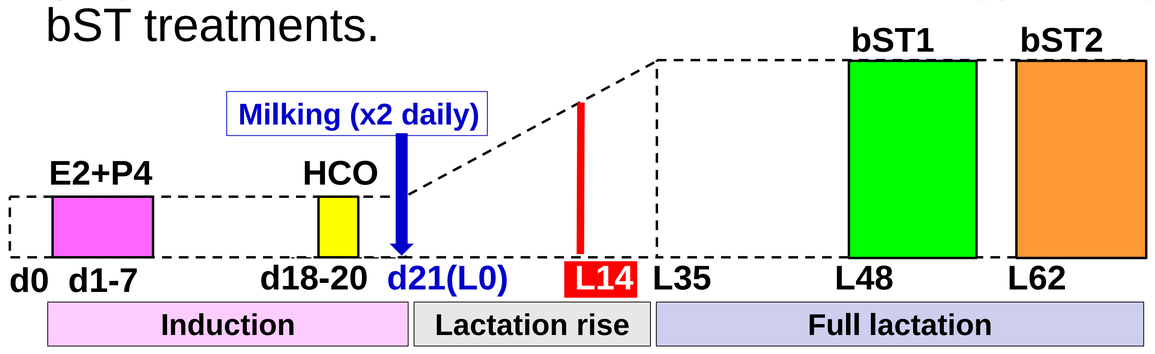
The objective of this work was to study **the effects of 2 low-dose treatments** in the **lactational and ingestive responses of dairy ewe-lambs** induced to lactate.

MATERIALS AND METHODS

- **Animals:**
  - **47 ewe-lambs** of 9 mo of age (Manchega, n = 24, 54 kg BW; Lacaune, n = 23, 58 kg BW), penned in 8 groups by breed and BW during spring (March-June).
  - **Fed ad libitum** (115%) a 75% forage TMR (0.73 UFL, 90 g PDIE, 98 g PDIN, 0.95 UEm; DM basis) according to INRAtion 3.3 (INRA, 2007) during 4 mo.
- **Lactation induction treatments (Fig. 1):**
  - **Estradiol-17ß** (**E2**) and **progesterone** (**P4**) injections at reduced doses (s.c., d 1 to 7; **Table 1**) compared to Salama et al. (2007; *JDS 90*) and Ramírez-Andrade et al. (2008; *JDS 91*).
  - **Hydrocortisone** (**HCO**; 50 mg/d i.m., d 18 to 20).

Hormonal dose	**E2** (mg/kg BW)	**P4** (mg/kg BW)
One half (**HD**)	0.25	0.63
One third (**TD**)	0.17	0.42

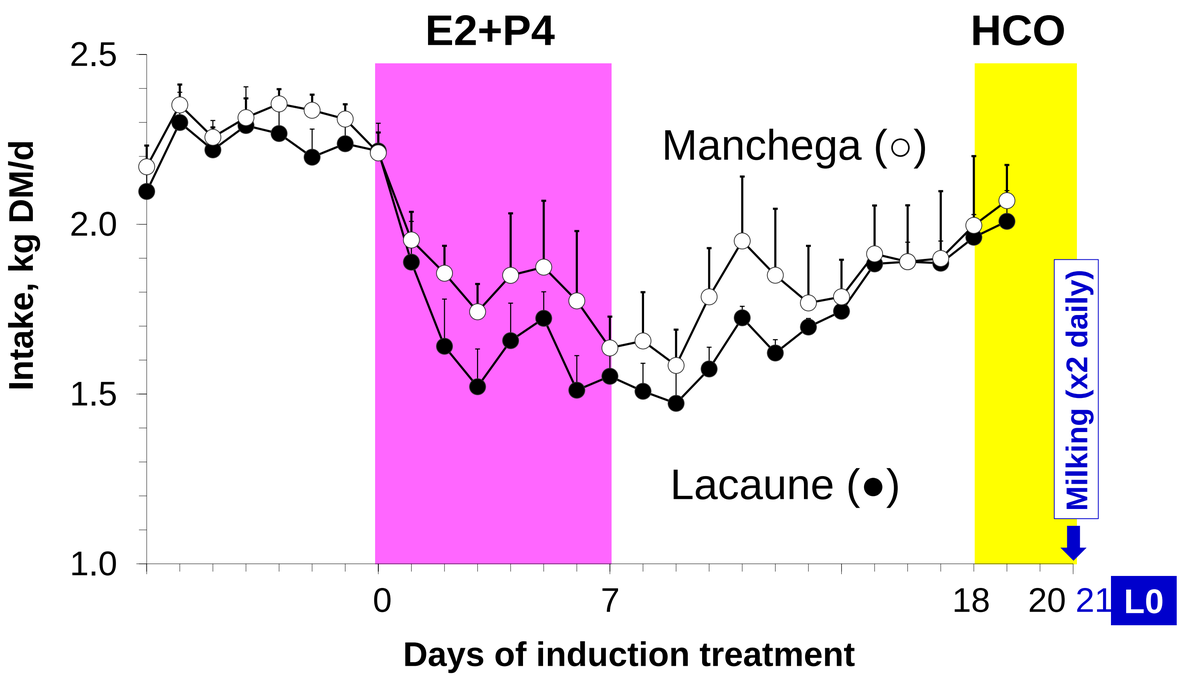
  - **Milking** (×2 daily) from d 21; lactation success evaluated at d 14 (**L14**) of lactation (milk yield threshold: Manchega, 0.2 L/d; Lacaune, 0.4 L/d).
- **Lactation enhancement:**
  Ewe-lambs yielding over the threshold were treated with growth hormone (s.c., 250 mg bST/ewe) at d 48 (**L48**) and d 62 (**L62**) of lactation.
- **Dry matter intake (DMI) recording:**
  - **Group DMI** recorded daily (4-wk before and 10-wk after induction treatments).
  - **Individual DMI** estimated by fecal partitioning using PEG 6000 (50 g/d for 14 d) as indigestible marker (Caja et al., 2009; *60th EAAP Annual Meeting*) during bST treatments.



- **Statistical analyses:**
  - Proc MIXED and GLM of SAS (v. 9.1)

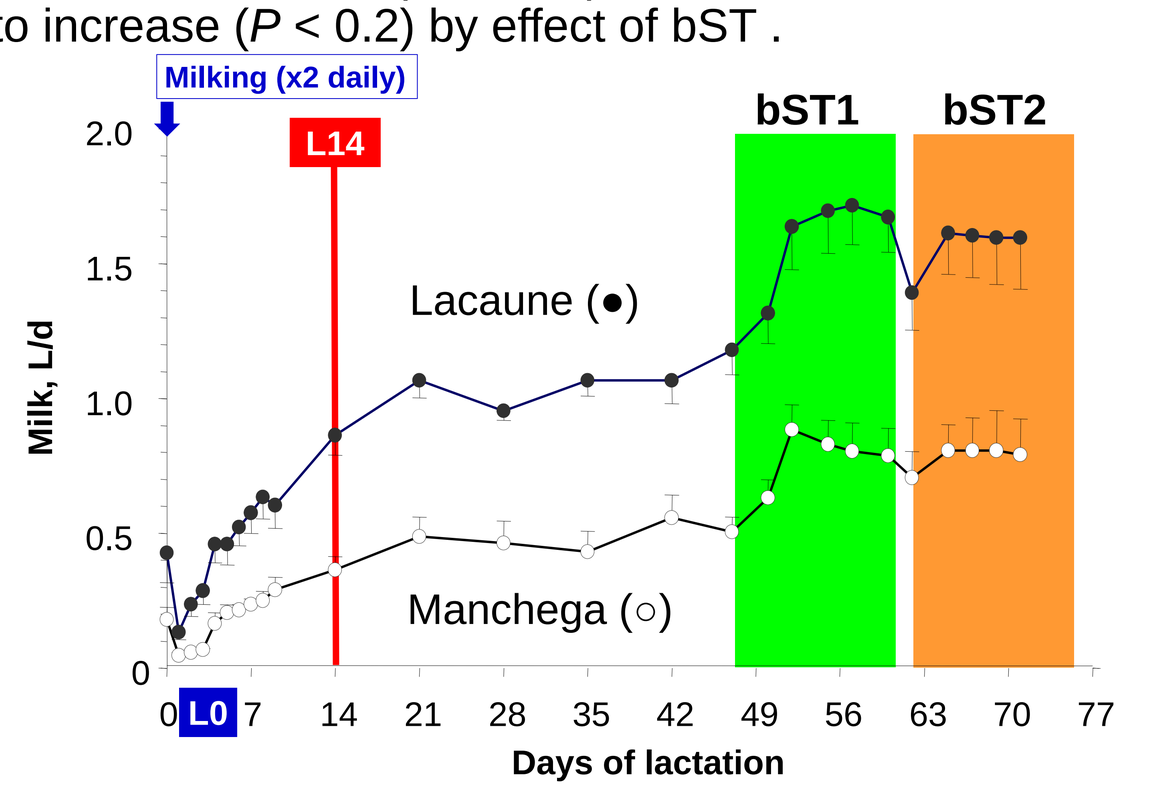
RESULTS

Induction treatments decreased DMI according to E2+P4 dose (HD, -28%; TD, -18%; $P < 0.05$) but recovered thereafter (**Fig. 2**).



Lactation success at L14 was 55%, agreeing previous results in sheep induced to lactate in spring. No treatment or breed effect were detected ($P > 0.05$).
Onset of lactation increased DMI by 16% ($P < 0.05$).
Lacaune ewe-lambs yielded ~2 times more milk (L14) than Manchega, varying by induction treatment (HD, 817 mL/d; TD, 458 mL/d; $P < 0.01$), whereas milk yield in Manchega did not vary (351 mL/d).
No short-term differences in milk composition were observed by breed or hormonal dose ($P > 0.05$).

Milk yield increased markedly (Manchega, +114%; Lacaune, +90%; $P < 0.01$; **Fig. 3**), but milk protein content decreased ($P < 0.01$) and individual DMI tended to increase ($P < 0.2$) by effect of bST .



CONCLUSIONS

- **Lactation induction treatments decreased intake** (~20 to 30%) according to the E2+P4 dose used.
- Lactation success was low (~50%), but **no reason justified using more than the one half E2+P4 dose**.
- **bST markedly increased** (~100%) **the induced milk yield** to values similar to naturally lactating ewe-lambs.