Reproductive performance of Lacaune dairy sheep exposed to artificial long days followed by natural photoperiod without and with additional progestagen treatment during the nonbreeding season

Summary / Zusammenfassung
This study compared the reproductive performance of Lacaune dairy ewes exposed to a light program and subsequent male introduction without (n=36) or with (n=36) an additional 6-day progestagen treatment during the non-breeding season. All ewes were exposed to extended day length (16 h light and 8 h darkness) for 77 days during winter (15th of December until 2nd of March) followed by increasing natural photoperiod. At the end of the photoperiodic treatment 3 blood samples were collected 6 days apart for progesterone (P4) analysis to determine cyclic activity. One half of the ewes were additionally subjected to a 6-day progestagen treatment in combination with PGF2α and eCG at insert withdrawal. Rams fitted with marking harnesses were introduced to females for 45 days and marked ewes recorded. Ewes exposed to the light program only were joined 40 days after the end of photoperiodic treatment, ewes with additional progestagen treatment were joined one day after insert removal (40-44 days after the end of photostimulation). Lambing data were recorded and fertility (percentage of ewes lambing, lambing rate and litter size) assessed to first service period and overall. Mean serum P4 concentrations were similarly (P>0.05) low in both groups (0.4-0.7 ng/mL vs. 0.4-0.6 ng/mL). Based on elevated P4 levels (> 1ng/mL), evidence of luteal activity was found in 27.8 % of the ewes at the end of the light program. Estrus response was equally high (97.2%) and estrus distribution highly synchronized in progestagen treated ewes (91.7% within four days). In ewes exposed to the light program only estrous activity was recorded within 4 days (6 ewes), from day 8 to day 17 (17 ewes) and from day 19 to day 25 (12 ewes) after joining. The percentage of ewes that lambed to the first service period was higher (P < 0.05) in ewes exposed to the light program only than in the group additionally treated with progestagen/PGF2α/eCG (94.4% vs. 69.4%). Overall, the percentage of lambing ewes was similar in both groups (97.2% and 94.4%) and lambing rates (1.4-1.9) as well as litter sizes (1.9-2.1) were high and not influenced (P>0.05) by the treatment. In conclusion, this study demonstrates that exposition of Lacaune ewes to artificial long days followed by natural day length and male introduction is highly effective to induce fertile estrous activity during the non-breeding season and offers a reliable and practical alternative to hormonal manipulation for out-of-season breeding in sheep.

Project Leadership and Contacts / Projektleitung und Kontakte
Prof. Dr. med. vet. Fredi Janett (Project Leader) fjanett@vetclinics.uzh.ch
Dr. med. vet. med. vet. Andreas Fleisch (Project Leader) afleisch@vetclinics.uzh.ch
Dr. med. vet. Marion Piechotta
Prof. Dr. med. vet. Heiner Bollwein hbollwein@vetclinics.uzh.ch

Funding Source(s) / Unterstützt durch
Universität Zürich (position pursuing an academic career)

In Collaboration with / In Zusammenarbeit mit
Dr. Marion Piechotta, Clinic for Cattle, University of Veterinary Medicine Germany
Hannover Foundation, Bischofsholer Damm 15, 30173 Hannover, Germany
Duration of Project / Projektdauer
Feb 2013 to Jan 2015