

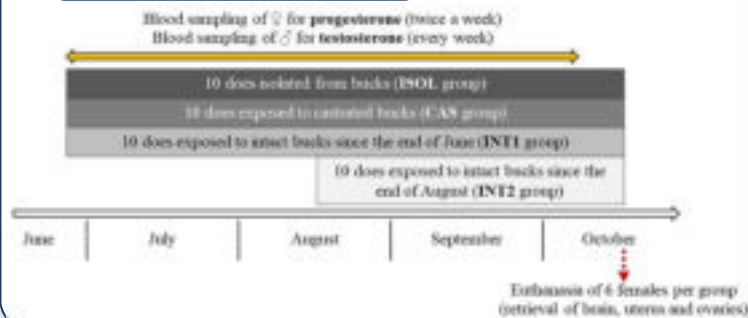
Shortening the period of exposure of young does to sexually active bucks and consequences on puberty

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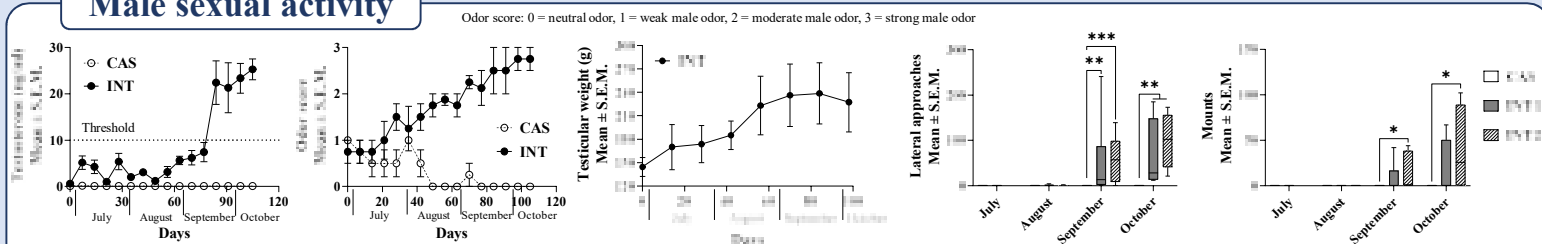
Introduction

In small ruminants, sociosexual cues play a major role in the control of reproduction (1). In goats, the introduction of an intact buck becoming sexually active induces an earlier puberty onset of spring-born does (2). However, this effect was observed by exposing the females from weaning (during June), several months before the males entered the breeding season (during September). As exposed females became pubescent in September, this study aims to show whether a shortened exposure of females to males just before their entry into the breeding season (mid-August) can also trigger this phenomenon of puberty acceleration. The second objective of this study is to assess whether exposure to the sexually active buck triggers an early maturation of the neuroendocrine network, in particular kisspeptin neurons known to have a key role in the puberty onset in mammals.

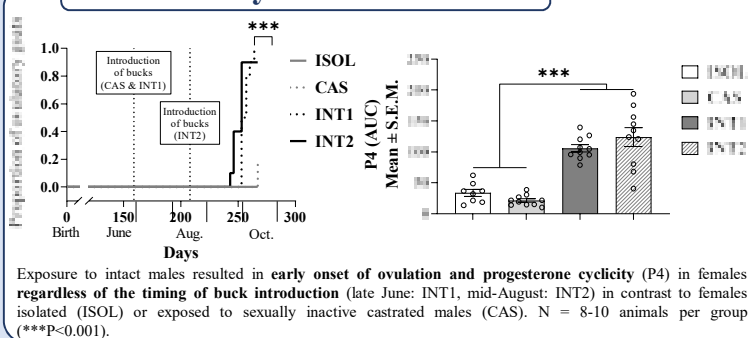
Experimental design



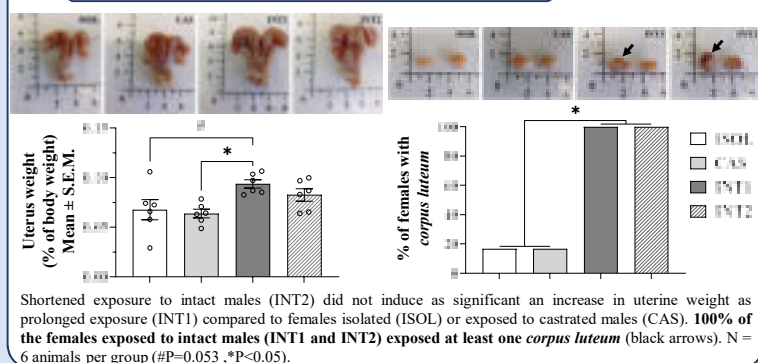
Male sexual activity



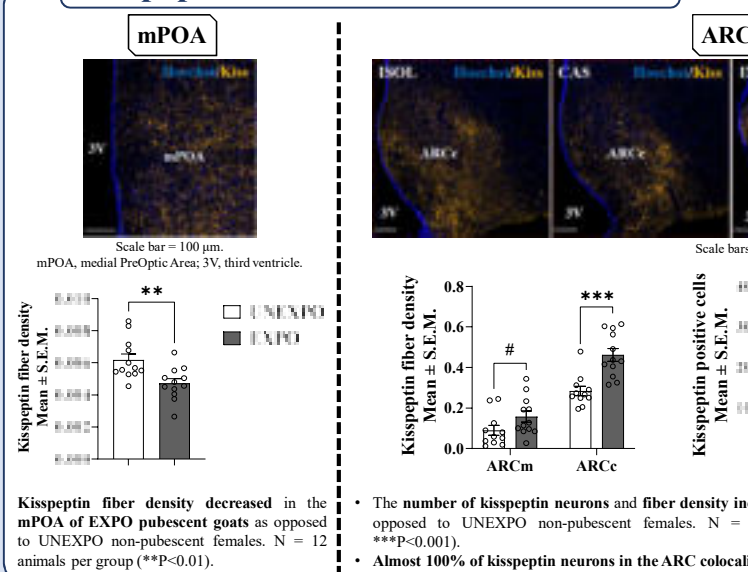
Puberty acceleration



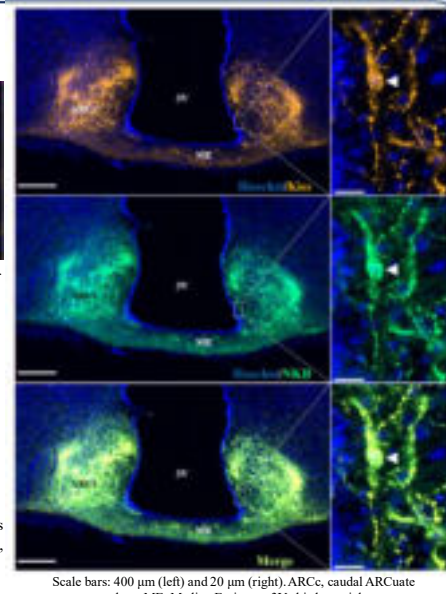
Reproductive tract maturation



Kisspeptin neural network maturation



Unexposed females (UNEXPO = ISOL + CAS) vs. Exposed females (EXPO = INT1 + INT2)



Conclusions

Our results confirm the efficiency of sexually active buck in inducing goat puberty acceleration as described previously (2). Shortening the exposure time to males also caused this phenomenon. Thus, the months of exposure while bucks are inactive seem unnecessary to trigger female puberty onset. This study also demonstrates that exposure of females from the prepubertal period to sexually active males induces neuroendocrine changes, particularly in the kisspeptin neural network of the ARCc. Since kisspeptin has a key role in the pubertal transition, these changes may be responsible for the early initiation of ovulatory activity in females. Since the majority of kisspeptin neurons colocalize NKB (Neurokinin B), our results support the hypothesis that the development of the KNDY neural network could be a major neuroendocrine change leading to GnRH secretion and therefore an earlier pubertal transition induced by the buck. Further investigations are needed to determine the sensory modalities underlying this early hypothalamic maturation.