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**Prolactin and wool growth
in the
Romney ewe**

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Abstract

The effects of seasonal and experimental changes in plasma prolactin (PRL) concentration on wool growth in non-pregnant and breeding Romney ewes were assessed. Seasonal changes in plasma PRL concentration appeared to be primarily determined by photoperiod, rather than ambient temperature. The seasonal winter decline in wool production was prevented when circulating PRL levels were elevated during the winter by long day photoperiod. Endogenous PRL secretion was inhibited during pregnancy in breeding ewes, but was also influenced by photoperiod and season. A significant depression in wool growth was measured within the first 60 days of gestation, which was not associated with feed intake or changes in live weight. The reduction in wool growth was not associated with changes in circulating PRL concentration but is likely to be mediated by one or a combination of other maternal hormones. Clean wool growth rate, mean fibre diameter and fibre length growth rate all increased at or before parturition indicating that an inhibitory effect on wool growth was removed after the birth of the lamb. A consequence of higher wool growth rates during lactation was increased winter wool production in winter-lambing ewes. Photoperiod-induced increases in PRL concentration during pregnancy, at parturition, and during lactation were associated with significant medium- to long-term stimulatory effects on wool growth. The suppression of PRL concentration with bromocriptine, was associated with lower rates of long-term wool growth. Collectively these results suggest that plasma PRL has a stimulatory effect on wool growth in the Romney ewe.

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List of Abbreviations

A	allowance (<i>component of feed intake</i>)
ACTH	adrenocorticotrophic hormone
BSA	bovine serum albumin
CIDR	controlled internal drug release
DM	dry matter
EDTA	ethylenediaminetetraacetic acid
GH	growth hormone
h	hours
IGF(s)	insulin-like growth factor(s)
IRA	Innovative Research of America
LD	long days
min	minutes
M	maintenance (<i>component of feed intake</i>)
NaCl	sodium chloride
NaOH	sodium hydroxide
ND	natural days
OFDA	Optical Fibre Diameter Analyser
oPRL	ovine prolactin
PBS	phosphate-buffered saline
PEG	polyethylene glycol
PL	placental lactogen
PMSG	pregnant mare serum gonadotrophin
PRL	prolactin
s	seconds
SD	short days
T ₃	tri-iodothyronine
T ₄	thyroxine
W ^{0.25}	initial wool-free metabolic live weight