THE EFFECTS OF RESTRICTED SUCKLING AND PREPARTUM NUTRITIONAL LEVEL ON REPRODUCTIVE PERFORMANCE OF PRIMIPAROUS CROSSBRED BEEF COWS

A thesis presented in partial fulfilment
of the requirements for the degree
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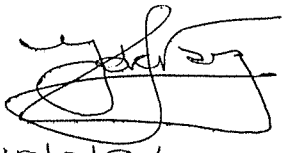
Signed 

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In memory of my uncle Pardo who used to pose many of the questions addressed in this thesis

ABSTRACT

The objective of this experiment was to study the effect of suckling restriction by fitting nose plates to calves on the reproductive performance of first calving crossbred beef cows managed at two nutritional levels in mid-gestation.

Reproductive activity was recorded in 21 two-year-old Hereford x Friesian and Simmental x Friesian primiparous cows before and after restriction of calf suckling. Cows were allocated two pastures allowances from day 112 to 212 of gestation so that the high nutrition (HN) group gained 0.75 kg/day, whereas the low nutrition (LN) group gained 0.17 kg/day during mid-gestation. Suckling was suppressed for 7 days by fitting nose plates to 46-day-old calves in the restricted suckling (RS) group, whereas the normal suckling (NS) group remained as a control. Ultrasound examinations and blood sampling were carried out at weekly intervals from day 18 and day 25 *post partum*, respectively, to evaluate ovarian activity and serum progesterone concentrations. Calf grazing and suckling activity was observed for 3 h per day on 2, 5 and 3 days before, during and after treatment, respectively.

Dominant follicles (DF) in the ovaries occurred in all cows by day 32 *post partum* and underwent a pattern of growth and atresia before first ovulation. Restricted suckling cows had a mean 18 days shorter interval from calving to conception than NS cows (76.0$\pm$5 vs 94.1$\pm$6 days, $P<0.05$), whereas genotype and nutritional treatment had no effect on interval to conception. However, the beneficial effect of suckling restriction on reproductive performance was apparent only in those cows fed a high pasture allowance in mid-gestation and consequently calved in better condition than NS cows. Restricted suckling calves spent more time grazing during the period of attachment of nose plates and differences in behaviour remained over a further 5 days after nose plates were removed (62.4$\pm$7 vs 38.6$\pm$7 minutes spent

grazing; $P<0.001$), but were lighter at weaning (146.7$\pm$3 vs 162.4$\pm$3 kg; $P<0.01$).

Despite the lower calf liveweight at weaning it is concluded that manipulation of suckling through fitting nose plates to calves can be successfully used to shorten the interval from calving to conception in primiparous cows fed higher pastures allowances during mid-gestation and consequently calved in better body condition.

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Finally, I should say I have enjoyed very much studying in New Zealand, something which was approached with passion and responsibility.

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LIST OF ABBREVIATIONS

BC	Body condition
CIDR	Controlled internal drug release
CL	Corpus luteum
cm	Centimetre
DF	Dominant follicle
DM	Dry matter
FSH	Follicle-stimulating hormone
GH	Growth hormone
GnRH	Gonadotrophin releasing hormone
h	Hour
ha	Hectare
HN	High nutrition
HxF	Hereford x Friesian
ICC	Interval from calving to conception
IGF1	Insulin-like growth factor 1
IU	International Units
kg	Kilogram
LH	Luteinizing hormone
LN	Low nutrition
LWG	Liveweight gain
ME	Metabolisable energy
MJ	Megajoules
mg	milligram
min	minute
ml	millilitre
mm	millimetre
NEFA	Non esterified fatty acids
ng	nanogram
NS	Normal suckling
PCLI	Interval from calving to occurrence of first corpus luteum
PMSG	Pregnant mare serum gonadotrophin
PPAI	Interval from calving to resumption of ovarian cyclic activity

RS	Restricted suckling
sem	Standard error of the mean
SxF	Simmental x Friesian
vs	Versus
ug	microgram

Statistical terms

The following symbols have been used throughout the text to indicate various levels of significance:

SYMBOL	LEVEL OF SIGNIFICANCE
***	P<0.001
**	0.001<P<0.01
*	0.01<P<0.05
†	0.05<P<0.10
ns	0.10<P