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**COMPUDOSE,
ITS EFFECTS ON HEREFORD X
FRIESIAN HEIFERS**

A thesis presented in partial fulfilment
of the requirement for the degree of
Master of Applied Science (in Animal Science)
at Massey University.

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Dedicated to my family and friends.

ABSTRACT

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Compudose is an oestrogenic growth promotant that improves liveweight gain and feed conversion efficiency in steers. In the past it has not been recommended for use in breeding heifers because of the adverse effects of oestrogen treatment on reproductive performance. The effects of Compudose on liveweight gain, skeletal development, lactational performance, carcass characteristics and offspring performance in heifers at pasture are unknown. However, the expected increase in liveweight gain from Compudose treatment may allow target growth rates to be attained in heifers at critical times of the year, without lactational performance being affected.

This study investigated the effect of treating Hereford x Friesian (H x F) once-bred heifers (OBH) with Compudose 400 at 3 months (90 days) of age (Compudose 90) and 7 months (210 days) of age (Compudose 210) compared to non-treated heifers (Control). Compudose 90 heifers (n = 14) gained 0.63 kg/day compared with Control heifers (n = 17) which gained 0.59 kg/day for 385 days from the time of implantation (6.8% increase, $P < 0.05$). Subsequently Compudose 90 heifers achieved greater liveweights than Control ($P > 0.05$) and Compudose 210 (n = 17) heifers ($P < 0.05$) at pre-mating (by 17.7 kg and 16.9 kg, respectively), pre-calving (by 13.7 kg and 25.3 kg, respectively), weaning (by 13.9 kg and 32.8 kg, respectively) and slaughter (by 23.1 kg and 39.9 kg, respectively). Liveweight gain between Control and Compudose 210 heifers did not differ over the 383 day period of implantation. Carcasses of Compudose 90 heifers were 10.5 kg heavier than carcasses of Control ($P > 0.05$) and 19.2 kg heavier than carcasses of Compudose 210 heifers ($P < 0.05$).

Wither height, girth, hip height, hip width, pelvic height and pelvic area did not differ significantly between treatment groups, but pelvic width of Compudose-treated heifers was significantly smaller than that of Control heifers ($P < 0.01$).

Compudose 90 and Compudose 210 heifers had an average calving date 8 days ($P < 0.10$) and 10 days ($P < 0.05$), respectively, later than the average calving date of Control heifers, and more compact calving spreads.

There were no treatment differences in calf birthweight, however calves born to Control heifers were 15.3 kg and 16.2 kg heavier at weaning than calves born to Compudose 90 and Compudose 210 heifers ($P < 0.05$).

Compudose treatment and associated higher growth rates did not affect milk yield, as determined by the weight-nurse-weigh (WNW) method, at 4 and 8 weeks of lactation; udder volume at 4 weeks, 8 weeks and 12 weeks of lactation (weaning), and at pre-slaughter; or udder weight at slaughter.

There were no significant differences in carcass quality characteristics between treatment groups. However, carcasses of Compudose-treated heifers tended to be shorter ($P < 0.10$) and have a greater rib-eye area. No significant differences in fat content, as determined by the weight of kidney and pelvic fat and fat depth, were detected between treatment groups.

Implanting heifers with Compudose at 3 months of age is more beneficial than implanting heifers with Compudose at 7 months of age, but the small liveweight gain advantage would not be economically advantageous. It is concluded that Compudose is not a practical solution for improving the rearing of beef or dairy heifers, despite lactational performance not being affected.

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LIST OF ABBREVIATIONS

\$	dollar
%	percent
®	Registered Trademark
°C	degree celcius
μCi	microcurie
~	approximately
c.	about
DES	Diethylstilboestrol
DNA	deoxy ribose nucleic acid
DO%	dressing-out percent
E	oestradiol
H x F	Hereford x Friesian
h	hour (s)
HBI	High breeding index
I	iodine
IU	international unit(s)
kg	kilogram(s)
kg/day	kilogram(s) per day
kg ^{0.75}	metabolic bodyweight
kgDM	kilogram(s) of dry matter
l	litre
LBI	Low breeding index
LD	<i>Longissimus thoracis</i> muscle
LH	lutensising hormone
mg	milligram(s)
mins	minute(s)
ml	millilitre(s)
mm	millimetre(s)

mM	millimole(s)
MY	Milk yield
n	number of observations
ng/l	nanogram(s) per litre
OBH	Once-bred heifer
r	correlation
RNA	ribose nucleic acid
SE	standard error
TOH	tritiated water
US	United States
UV	Udder volume
VFI	Voluntary feed intake
vs	versus
WNW	weigh-nurse-weigh

Levels of significance

P < 0.001