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**A STUDY OF LACTATIONAL AND REPRODUCTIVE
PERFORMANCES OF AUTUMN OR SPRING CALVING
COWS IN COMMERCIAL WINTER MILK SUPPLY HERDS**

**A thesis presented in partial fulfilment of the requirements for the degree of
Master of Agricultural Science in Animal Science**

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1996**

ABSTRACT

Chang'endo.F.B (1996). *A study of lactational and reproductive performances of autumn or spring calving cows in winter milk supply herds.* Master in Agriculture Science Thesis Massey University. Palmerston North New Zealand.

Data on lactational and reproductive performances for 1993 and 1994 of dairy cows which calved in autumn or in spring on eight commercial winter milk supply farms around Palmerston North were collected. The eight commercial winter milk supply herds had a calving spread condensed into autumn and spring seasons. There were 7689 calvings recorded involving 3787 cows.

The lactational parameters measured were yields of milk fat and milk protein per lactation, and days in milk (DIM) per cow. The mean milk fat production for the autumn calved cows was 206 kg/cow and 166 kg milk protein/cow (372 kg milk solids) per lactation while the spring calved cows produced 199 kg milk fat/cow and 160 kg milk protein/cow (359 kg milk solids) per lactation. The mean lactation length (DIM) for the autumn calved cows was 282 days, while the spring calved cows had a mean lactation length of 258 days ($P<0.05$). The mean daily milk fat yield averaged across the days in milk was 0.73 kg per cow for the autumn calved cows while the spring calved cows had a mean daily milk fat yield of 0.77 kg/cow ($P<0.05$). The mean values of milk production in the second and third months of lactation were 18 litres per day and 17 litres per day for the autumn calved cows while spring calved cows produced 22 litres per day during the second month of lactation and 19 litres per day during the third month of lactation respectively.

The reproductive parameters measured were calving interval (CI), 4 weeks submission rates (SR), 42 day non-return rates (NNR), services per conception, 4 week calving rates and empty rates.

The autumn calved cows had a longer CI than the spring calved cows; 390 days vs 372 days ($P<0.05$).

The autumn calved cows had a lower average 4 weeks SR than the spring calved cows; 71% vs 81% ($P<0.05$).

The autumn calved cows had a lower average 42 day NNR (conception rate) than the spring calved cows; 55% vs 64% ($P<0.05$).

The autumn calved cows had a higher average of services per conception than the spring calved cows; 1.9 vs 1.6 ($P<0.05$).

The autumn calved cows had a lower 4 week calving rate than the spring calved cows; 41% vs 54% ($P<0.05$).

The autumn calved cows had a higher average empty rate than the spring calved cows; 12% vs 10% ($P<0.05$).

These results show that cows which calved in autumn actually produced larger yields of milk fat and milk protein per lactation than those which calved in spring. However, these higher yields were achieved in longer lactations, and the autumn cows produced lower average daily yields than the spring calved cows.

The lower daily yields during the second and third months of lactation by the autumn cows, indicated that these cows were on a lower level of feeding at this stage than the spring calved cows.

The autumn calved cows had lower values for all aspects of reproductive performance than the spring calved cows. This difference is probably due to, at least partly, to the lower level of feeding in early lactation.

These herds are relatively high producing, and therefore it can be deduced that they are generally well managed. Nevertheless the autumn calved cows were fed less well in early lactation than the spring calved cows, causing slightly poorer performances.

ACKNOWLEDGEMENTS

I wish to express my deepest respect and sincere thanks to my supervisors, Dr C.W.Holmes and Dr M.F.McDonald for their invaluable guidance, valuable advice, encouragement and stimulating criticism throughout this study and for their dedicated assistance during the whole process of preparing this thesis.

I also extend sincere thanks to the eight commercial winter milk supply farmers, who took time to show me their farm records and to answer the many questions about their production systems which I asked them. This thesis is based entirely upon data provided by these farmers and without their cooperation, the study would not have been possible.

Data analysis has been done with the patient help of Dr Charles Lawoko and Mrs Wallbutton.

I wish to express special appreciation to my dear wife Eunice who has been a loving and supportive partner throughout the period I have been away from Tanzania, made this opportunity for higher studies possible.

Finally, I would like to express my sincere appreciation to the New Zealand Government for financial support and the Principal Secretary Ministry of Agriculture and Livestock Development for allowing me to undertake post graduate studies at Massey University.

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LIST OF ABBREVIATIONS

- AB**=Artificial breeding
AC=Autumn calved cows
AI=Artificial insemination
BI=Breeding index
BCS=Body condition score
Ca=Calcium
CI= Calving interval
CL=Corpus luteum
CP=Crude protein
CR=Conception rate
DIM=Days in milk
DIP=Degradable intake protein
EB=Energy balance
FCE=Feed conversion efficiency
FFA=Free fatty acid
FSH=Follicle stimulating hormone
ha=Hectare
K=Potassium
KgDM=Kilogram dry matter
LH=Luteinising hormone
LIC=Livestock improvement corporation
MCD=Median calving date
ME=Metabolisable energy
Mg=Magnesium
MT=Empty rate
N=Nitrogen
NEFA=Non-esterified fatty acid
NNR=Non-return rate
NRC=National research council

NZDB=New Zealand dairy board

NS=Non significant

P=Phosphorus

PPA=Post partum anoestrus

PUN=Plasma urea nitrogen

PSC=Planned start of calving

PSM=Planned start of mating

Rel=Reliability

SAG=Sexual active group

SC=Spring calved cows

SD=Standard deviation

SR=Submission rate

SUN=Serum urea nitrogen

tDM=Tonne dry matter

UDP=Undegradable protein