

New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website www.nzsap.org.nz

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

Share— copy and redistribute the material in any medium or format

Under the following terms:

Attribution — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

NonCommercial — You may not use the material for [commercial purposes](#).

NoDerivatives — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

BRIEF COMMUNICATION

Effects of time-of-calving on dairy production: a farmlet study

M.J. AULDIST¹, K.A. MACDONALD, N.A. THOMSON, M. COULTER,
J.A.S. LANCASTER AND J.W. PENNO.

Most dairy cows in New Zealand are calved just prior to spring in order to maximise pasture utilisation. This practice is associated with marked irregularities in the volume and composition of milk supplied to factories, which is a major limitation of seasonally-calving, pasture-based dairying systems. The need to accommodate peak milk flow means that manufacturing plants are under-utilised for most of the season. Further, changes to milk composition can make it difficult to manufacture dairy products of high quality during some parts of the season, which necessitates the storage of product to meet out-of-season demand.

Such irregularities are caused by a number of factors, including nutritional factors associated with the changing quality and availability of pasture, and physiological and hormonal factors associated with the stage of lactation of the cows (Auld et al., 1997). One way of manipulating the lactation curve of the cows may, therefore, be to adjust the time of the year at which calving occurs. A previous study in New Zealand showed that autumn calving herds could be as profitable as spring calving herds (Garcia et al., 1998). In that study, nutritional demands were matched with pasture availability by adjusting stocking rate and feeding varying amounts of pasture and maize silage when required. A premium for winter milk was also applied.

The current study was designed to investigate the effects of calving at four different times of the year on milk production in farmlet systems which were otherwise similar in stocking rate and other farm management variables.

Four herds of 20 mixed-age Friesian cows were mated such that one herd calved during a 6-week period in each of July (JUL), October (OCT), January (JAN) and April (APR). All herds were managed at a stocking rate of 3.1 cows/ha on 6.48 ha farmlets at Hamilton, New Zealand. On each farmlet, 200 kg N/ha was applied annually, but the time of application differed for each herd and was determined by the nutritional requirements of the herds and expected pasture responses. The amount of silage made on each farmlet, and the time at which it was fed, was also determined by the prevailing pasture cover and nutritional requirements on each farmlet. No concentrate supplements were fed to any herd with the exception of the JAN herd, which were fed maize grain (54 kg DM/cow) in April of one season. Generally, only silage made on the farmlet was fed back to that herd. Because pasture growth was approximately 15% lower than typical for the summers during this trial, however, an extra 116, 306 and 280 kg DM/cow of pasture silage (total over two lactations) was bought in for the OCT, JAN and APR herds respectively. The trial commenced with the calving of the July calvers in 1998, and finished when each herd had completed two entire lactations (April 2001).

Samples of the daily milk were collected once a week

from each cow for the duration of the trial using in-line milk meters that also facilitated the gravimetric measurement of milk yield. Concentrations of fat and protein in milk samples were measured using an infrared milk analyser (Milkoscan 133B; Foss Electric, Hillerød, Denmark). Intakes of pasture and silage were also estimated weekly using a visual appraisal of herbage disappearance. Cow live weight and condition score were determined fortnightly.

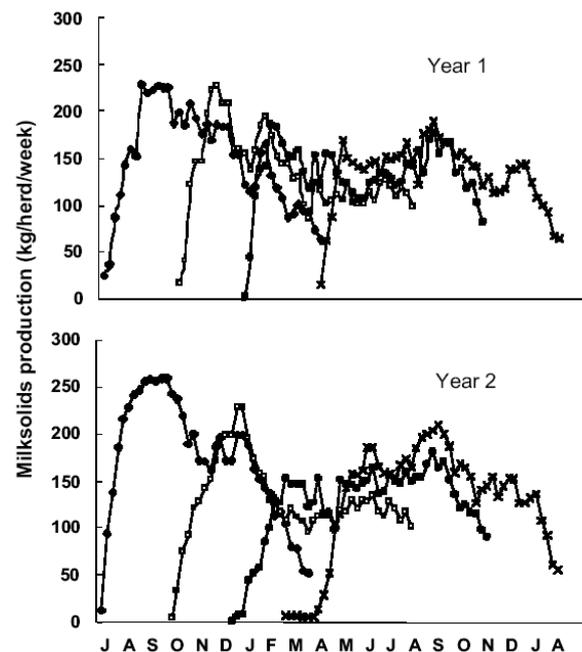
Mean lactation lengths were shortest for the JUL herd and longest for the JAN and APR herds (Table 1). Despite this there were no significant effects of time-of-calving on the lactation yield of milk, fat, protein, or total milksolids per cow or per hectare.

The total weekly production of milksolids for each herd throughout their two lactations is presented in Figure 1. There were marked differences between the herds in the pattern of milksolids production across the lactation. Overall the JUL had the highest peak levels of production.

TABLE 1. Lactation lengths and yields of milk, fat and protein for herds of cows calving in July, October, January and April.

	July	October	January	April	s.e.d.	P
Lactation length (d)	249	262	292	287	4.8	**
Milk (kg/cow)	4018	3681	3726	3843	174	N.S.
Fat (kg/cow)	184	169	171	180	8.3	N.S.
Protein (kg/cow)	136	123	128	134	6.5	N.S.
Milksolids (kg/cow)	320	292	299	314	14.8	N.S.
Milksolids (kg/ha)	988	901	924	968	45.7	N.S.

FIGURE 1. Total herd milksolids production for cows calving in July (♦), October (○), April (●) or January (x).



¹ Present address: Department of Natural Resources and Environment, Agriculture Victoria – Ellinbank, RMB 2460 Hazeldean Road, Ellinbank VIC 3821, Australia.

The other three herds had much flatter lactation curves, and often displayed “double peaks”.

These data confirm that changing the time of calving would have a minimal impact on the total milk solids production of New Zealand dairy farms. Irrespective of the time of calving, and in spite of increased variation in pasture availability and quality due to atypical summer weather, all herds in this study produced similar quantities of milk solids per lactation, as was also shown by Garcia *et al.* (1998). In contrast to Garcia *et al.* (1998), in the current study this was achieved utilising a similar level of inputs for all herds. There were, however, some differences between herds that may have affected the profitability of the systems. For example, the amount of silage made was different on each farmlet; in the case of the OCT farmlet, more pasture had to be conserved in spring (when the cows were dry) and fed back later in the season.

Although the total milk solids production was similar for each herd, the patterns of milk solids across the season were different for each herd. This was similarly reported by Auld *et al.* (1997) and Garcia & Holmes (2001), and shows that manipulating the time-of-calving is a potential tool for overcoming problems caused by the seasonality of supply in New Zealand's typical seasonally-calving dairying systems. For example, the JAN and APR herds had much flatter lactation curves than the JUL and OCT herds, implying a much more consistent supply of milk to factories.

Changing away from traditional spring-calving dairying systems could reduce problems associated with the seasonality of milk supply without any decline in total milk solids production.

The authors gratefully acknowledge the assistance of No. 2 dairy staff for animal care and sampling, M. Bryant and Milk Laboratory staff for milk analyses and B. Dow for statistical analyses.

REFERENCES

- Auld, M.J.; Walsh, B.J.; Thomson, N.A. 1997: Effects of time-of-calving on dairy production. *Proceedings of the New Zealand Society of Animal Production* 57: 204.
- Garcia, S.C.; Cayzer, F.J; Holmes, C.W.; MacDonald, A. 1998: The effect of calving season on milk production. A system study. *Proceedings of the New Zealand Society of Animal Production* 58: 61-63.
- Garcia, S.C.; Holmes, C.W. 2001: Lactation curves of autumn- and spring-calved cows in pasture-based dairy systems. *Livestock production science* 68: 189-203.