

THE CHANGE OF CALVING FREQUENCY IN DIFFERENT MONTHS FOR DHI DAIRY COWS IN TAIWAN

J. Y. Chen ⁽¹⁾, K. H. Lee ⁽¹⁾, C. L. Chung ⁽¹⁾, and Y. N. Jiang ⁽²⁾

Hsin-Chu Branch, Livestock Research Institute, Council of Agriculture ⁽¹⁾ National Taiwan University ⁽²⁾

Abstract

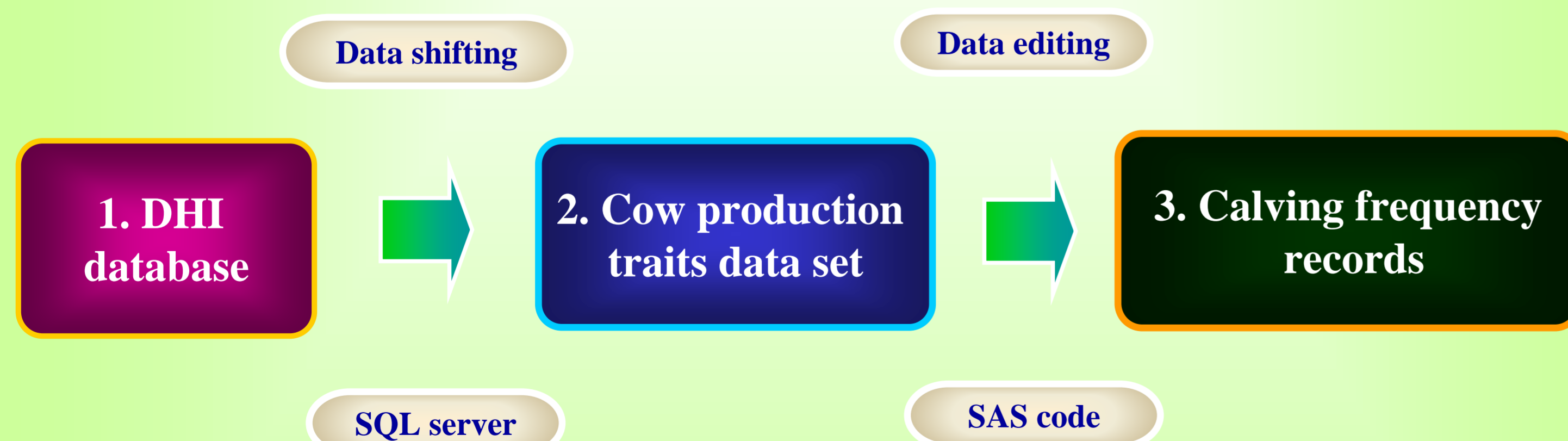
Milk price system in Taiwan has been divided into winter (from Dec. to Mar. of next year), warm (Apr., May, Oct., and Nov.) and summer (from Jun. to Sep.) seasons since 1990. The milk price during summer season is NT\$ 20.73/kg. The price difference between summer and winter seasons is NT\$ 8.99/kg. The milk price system in Taiwan seemed to have urged farmers adopting a milk production strategy to meet the fresh milk consumption in summer. The statistics of DHI database showed that the calving frequency of dairy cows in months of 2007 distributed with a "M" pattern. The calving frequency in March and September of the year were the two peaks, which were 11.0% and 10.4% respectively, and higher than 9% in April, May, June, and July. The increments of calving frequency were respectively 2.1%, 3.1%, 2.2% and 2.0% from April to July compared to those in 2002. With further analysis of the structure of calving frequency, we found that dairy cows calved in March mostly were primiparous with calving rate of 6.6%. However, dairy cows calved in September mostly were multiparous with calving rate of 8.0%. The calving frequency of these two kinds of dairy cows was highest in 2007. It was expected that dairy farms could increase milk production in summer when dairy cows were calved in March. According to a survey, with the aim to promote breeding rate in summer, many dairy farmers adopted effective strategies including forced ventilation with sprinklers and fans in the barn, enhanced heat detection and heat synchronization by administering hormone. The change of calving frequency in different months in this study was in accordance with specific breeding strategy in dairy farms to produce much more milk for high milk consumption in summer.

Key Words: Calving frequency, DHI dairy cows, summer milk

Introduction

Taiwan is situated at the tropical and subtropical area with typical high temperature and humidity in summer, lactation cows, therefore, are experienced to the serious heat stress. Because the milk consumption in summer is tremendously high in a whole year, it is a considerable challenge for the management of dairy farmers. The government has actualized the raw milk pricing system referred to the marketing pattern since 1991, the practice seems to have urged farmers adopting a milk production strategy to meet the milk supply in summer. Farmers would adjust the calving time of dairy cows in early spring and expect the lactation peak will be located in summer. Other advantages of this adjustment would be that cows, which are conceived successfully before summer, will calve again in coming spring and shorten open days and calving interval properly. The purpose of this study was to understand the situation of milk production strategy by analyzing the change of calving frequency in different months for DHI dairy cows in Taiwan.

Materials and Methods



1. Production records and milk samples of all individual cows in the DHI enrolled herds were collected and the database was established by Hsin-Chu Branch, Taiwan Livestock Research Institute.
2. The cows' basic, production and reproduction data in 2002 and 2007 were retrieved from DHI database.
3. According to the data set, there were 56,779 and 36,662 calving records for dairy cows in 2002 and 2007 respectively.

Results and Discussions

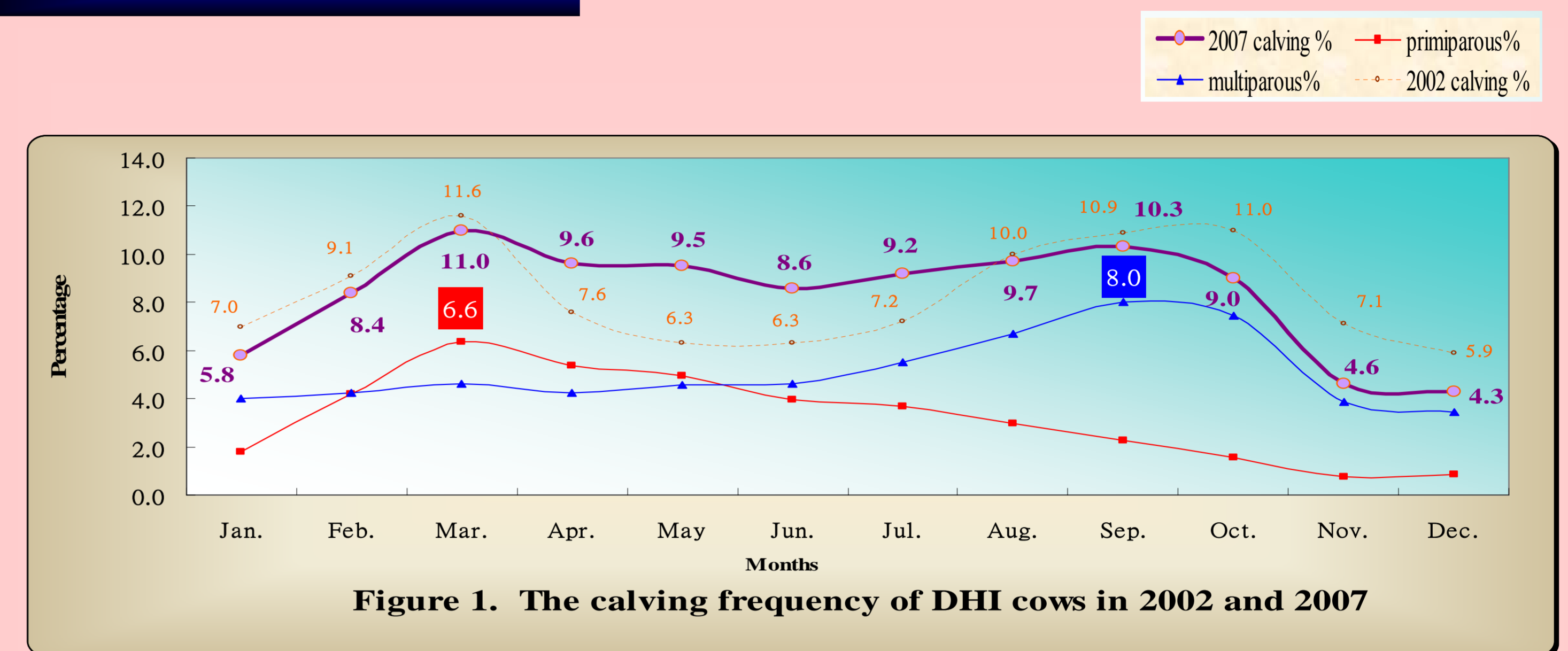


Figure 1. The calving frequency of DHI cows in 2002 and 2007

Table 1. The summary statistics of the milk production and composition variables (mean \pm sd) of DHI cows in 2007

Variables	The primiparous cows in March	The multiparous cows in September	Overall cows
Number of records	15,064	13,608	209,102
Average daily milk yield (kg)	22.8 \pm 6.1	23.8 \pm 8.1	23.3 \pm 7.6
305-2X-ME milk yield (kg)	7391 \pm 1383	7427 \pm 1870	7406 \pm 1676
Fat percentage	3.85 \pm 0.67	3.78 \pm 0.69	3.81 \pm 0.69
Protein percentage	3.28 \pm 0.35	3.22 \pm 0.35	3.25 \pm 0.35
Lactose percentage	4.82 \pm 0.28	4.74 \pm 0.32	4.77 \pm 0.31
Solid non fat percentage	8.86 \pm 0.47	8.69 \pm 0.5	8.77 \pm 0.46
Total solid percentage	12.72 \pm 0.95	12.48 \pm 0.92	12.58 \pm 0.94
Somatic cell count score	2.98 \pm 1.8	3.36 \pm 1.99	3.27 \pm 1.96

Table 2. The summary statistics of the reproduction performance variables (mean \pm sd) of DHI cows in 2007

Variables	The primiparous cows in March	The multiparous cows in September	Overall cows
Number of records	15,064	13,608	209,102
Age at first calving (months)	26.3 \pm 2.2	—	26.3 \pm 2.2
Interval from calving to bred (day)	78.1 \pm 29.3	80.4 \pm 35.2	83.9 \pm 36.1
Days open	147.5 \pm 61.6	151.1 \pm 65.6	152.3 \pm 65.3
Calving interval (day)	—	439.8	426.4 \pm 76.4
Service/conception	2.53 \pm 1.73	3.36 \pm 1.91	3.17 \pm 2.27

The monthly calving frequency in 2007 DHI cows showed that the calving frequency in March and September were the two peaks with 11.0% and 10.4% respectively (Fig. 1). The increments of calving frequency from April to July in 2007 were much more compared to those in 2002. With further analysis, we found that mostly primiparous heifers were calved in March with 6.6% calving frequency. However, cows calved in September were mostly multiparous with 8.0% calving frequency.

The production and reproduction performance of the DHI cows in the two peaks of calving frequency showed in tables 1 and 2. The average dairy milk for the primiparous heifers calved in March was lower than that of DHI average. However, the milk composition, milk quality and reproduction performance was better than those of DHI average. The primiparous calving in March should play a considerable important key in the management of milk production and help in high summer milk demand in Taiwan.

In summary, most farmers used the primiparous heifers calved in March as the production domain. Those heifers could have better reproduction, milk quality and milk composition than that of multiparous cows, even though the milk yield of primiparous were lower. If the calved heifers could be conceived before the end of May, with short open days, the goal of calving once a year could be achieved also. Changes of the monthly DHI calving frequency may provide the useful information in reproductive management for Taiwan dairy farmers, those changes are probable the results of the stimulus of raw milk pricing system and/or the specific milk consumption pattern.