

Transient effect of two milking permission levels on milking frequency in an Automatic Milking System with grazing

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Introduction

In Ireland automated milking systems (AMS) have been integrated with grazing and spring calving herds. This system presents a number of challenges, in particular when cows within a herd reach peak milk yield simultaneously. As a result there is less free time in the AMS, potentially leading to increased waiting time pre-milking and therefore, reduced time grazing. However, farmers could alleviate this pressure by reducing milking permission (MP) which subsequently reduces milking frequency (MF). Cows are permitted to be milk based on time since last milking and expected milk yield. The number of times the cow voluntarily visits the AMS and is permitted to be milked is defined as the milking frequency (MF). The objective of this study was to compare the transient effect of two levels of MP on cow MF.

Materials and Methods

An AMS was located on a 25.2ha milking platform divided into sections; A, B and C. Cows moved voluntarily to and from the paddock, passing through the milking yard, between the sections. The grazing area was allocated based on a demand of 18kg grass dry matter (DM)/cow/day over 3 grazing sections in 24hrs (Figure 1). Sixty two cows were randomly assigned to one of two groups with a treatment of either low (LP) or high (HP) MP of 2 and 3 times per day, respectively. Groups were balanced for breed, lactation and days in milk. The experiment was divided into 16 time periods grouped as: (a) period -1 (10 days), all cows with same MP (b) period 0 (10 days), LP and HP treatments (c) periods 1 to 12 (12 x 1 weeks), LP and HP treatments, and (d) periods +1 to +2 (2 x 1 weeks) all cows with same MP. The statistical model used was a repeated measures ANOVA in SAS (PROC MIXED) and Tukey's post-hoc analysis. The fixed effects were period, breed, days in milk and MP.

Results

The main effects of milking permission (MP) and period, and the interaction between MP and period were significant. Comparing MF between groups, there was no significant difference during periods -1, 0, +1 and +2 and there was a significant difference ($p < 0.05$) during periods 1 to 12. Comparing MF over time and within each group, period -1 was not significantly different to period +2.



Figure 1: Strip Grazing integrated with a Fullwood Merlin Automatic Milking System in an Irish spring calving system of dairy milk production.

Milking Permission 2 v 3 Times/Day

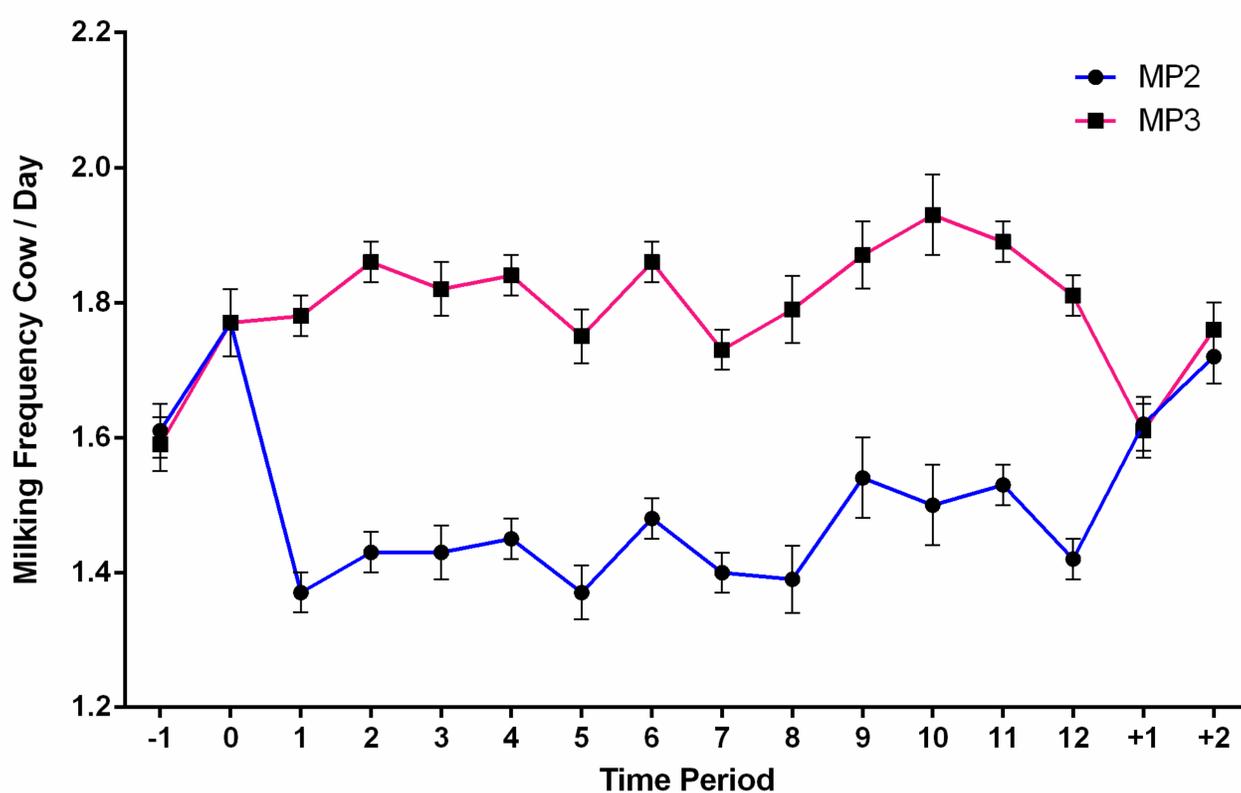


Figure 2: Milking frequency per cow per day is plotted against time period for two different levels of milking permission (MP) either low permission (LP) 2 times per day or high permission (HP) 3 times per day. Period -1 (10 days), all cows with same MP. Period 0 (10 days), LP and HP treatments. Periods 1 to 12 (1 week each), LP and HP treatments. Periods +1 and +2 (1 week each) all cows with same MP.

Conclusion

Once milking permission is set there is a requirement of between 10 and 14 days for milking frequency to adjust.

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