Effect of Automatic Feeding System (AFS) on Dairy Cows Feeding Activity

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**Abstract.**  Supplying a total mixed ration (TMR) to dairy cows with a higher frequency is a key factor to have more distributed visits to the feeding fence over 24 h and longer feeding times. All this optimize dry matter ingestion and stabilize the ruminal pH with positive effects on cows’ health and milk production. Running up to 16 TMR distributions ∙ day–1, automatic feeding system (AFS) allow to meet the herd’s nutritional needs without depending on human labour and incurring additional labour costs. A CMOS monochromatic camera (Lumenera LU125M, Lumenera Corporation, Canada) was used to monitor the effect of TMR distribution and push-up operated by an AFS (Vector system, Lely Holding, the Netherlands) on dairy cows’ attendance of feeding alleys. The study was carried out in a freestall-housed dairy farm from Lombardy (Northern Italy) with 121 lactating cows divided in two groups (A and B) and milked by two milking robots (Vector A4, Lely Holding, the Netherlands). Group A consisted of 58 animals and had available 63 feeding places, while Group B consisted of 63 cows with 69 feeding places. The camera was conveniently placed to frame the two feeding alleys and its settings (interval shooting, exposure time, gain) were controlled by a software tool written in Matlab v.R2017B (MathWorks Inc., Massachusetts, USA). Images were acquired at 5 minutes interval from 6 a.m. to 6 p.m. for ten consecutive days in January 2019 and the feeding place index (FPI), obtained by comparing the feeding cows to the feeding places, was calculated at the same interval. The poor lighting conditions of the barn did not allow acquiring neither images nor calculating FPI for the evening and night hours. Significant differences between FPI means calculated at each TMR distribution and push-up were tested by analysing the variances (JMP Pro 16.1, SAS Institute). Results showed that TMR distributions determine significant higher (P<0.01) FPI compared to TMR push-up (0.46 vs. 0.26). FPI increased up to 0.54 and 0.51 respectively after 15 and 30 minutes TMR distributions, even if the differences were not significant. On the contrary, FPI reduced significantly (P<0.01) to 0.19 after 30 minutes TMR push-up. These results confirm the feeding activity of dairy cows may be influenced by TMR distributions and push-up operated by AFS.