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# Feeding behaviour of dairy cows in forced or free cow traffic in Automatic Milking System (AMS)

L. Calamari<sup>1</sup>, F. Petrer<sup>2</sup>, A. Fava<sup>2</sup>, L. Stefanini<sup>2</sup>

<sup>1</sup> Istituto di Zootecnica. Università Cattolica del Sacro Cuore, Piacenza, Italy

<sup>2</sup> Azienda Sperimentale "V. Tadini". Loc. Gariga, Podenzano (PC), Italy

*Corresponding author:* Luigi Calamari. Istituto di Zootecnica. Facoltà di Agraria, Università Cattolica del Sacro Cuore. Via Emilia Parmense, 84, 29100 Piacenza, Italy - Tel. +39 0523 599274 - Fax: +39 0523 599276 - Email: luigi.calamari@unicatt.it

## ABSTRACT

Several options have been suggested in the literature for "inviting" the lactating cows to a milking unit, minimizing the interference with the activities of the cows during the day (eating, drinking, resting) and optimizing the welfare of the animals. The aim of this research was to evaluate the effects of forced and free cow traffic on feeding behaviour in primiparous (PR) and pluriparous (PL) cows. The trial was carried out in the experimental free stall barn "V. Tadini" equipped with a single box automatic milking system (Galaxy, Milkline) and with a 40 lactating cows group. Cows were fed once a day (at 07:30 a.m.) the same Total Mixed Ration (TMR). During the trial two different cow traffic situations combined with different feeds management were tested. In the 1<sup>st</sup> period forced cow traffic (FC) was used; in the 2<sup>nd</sup> period free cow traffic (FR) but with an increase of the concentrate fed in the milking unit (+1.5 kg/head/day) and a reduction of the concentrate percentage in TMR (from 44.5 to 41.5% as DM) was used. Each period lasted 30 days. During the last week of each period, the behaviour of 7 PR and 8 PL was individually monitored for two consecutive days using video cameras to record the time spent, as well as the number and the distribution of the visits in the feeding, resting and waiting milking areas. The feeding behaviour of the animals was significantly affected by the cow traffic situation. In PR the time spent, as well as the number of visits in the feeding area were significantly higher during FR *vs* FC (444 *vs* 357 min/d and 7.36 *vs* 4.53 n/d, respectively;  $P < 0.001$ ), while the time spent during each visit was shorter (62 *vs* 80 min;  $P < 0.001$ ). In PL the variations of feeding behaviour were less evident and only the time spent in the feeding area differed significantly (432 *vs* 362 min/d in FR and FC respectively;  $P < 0.05$ ). The time spent per day in the resting area was not affected by the cow traffic, but during FR a higher number of visits in PR was observed ( $P < 0.01$ ) and the time spent per visit was shorter both for PR and PL ( $P < 0.01$ ). Furthermore, cows in FR spent significantly less time in the waiting milking area (50.6 *vs* 87.2 min/d;  $P < 0.01$ ) and visited the AMS significantly less (2.2 *vs* 4.8 n/d;  $P < 0.01$ ). A higher activity in the feeding area, both during daytime and night-time, was observed in PR and PL during FR; nevertheless the differences were significant only during daytime (286 *vs* 218 min in FR and FC respectively;  $P < 0.01$ ) as a consequence of the higher number of visits after TMR distribution (3.92 *vs* 2.33 n/daytime;  $P < 0.01$ ). Our results indicate that cow traffic affects feeding behaviour, particularly in PR, with a significant increase, during FR traffic, of meals number and time spent in the feeding area, mainly during the daytime.

In conclusion the FR traffic seems preferable, but the choice of cow traffic has to consider also many other aspects related to the system and the management.