Evaluation of Udder Health, Nutritional Management, Milk and Welfare Parameters in a Greek Dairy Farm - Abstract

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Summary

The aim was to evaluate udder health, milk, nutrition and welfare indices of cows in a Greek dairy farm, in order to identify interventions that should ameliorate cows' welfare and optimize production. The study was conducted in a farm with 120 milking Holstein cows. Cows had a mean 305-days milk yield of 10,588 kg and were fed a total mixed ration (TMR). The study consisted of two parts. In part one, subclinical mastitis (SCM) epidemiology was evaluated, utilizing monthly somatic cell count (SCC) reports from 2015 until 2018. SCC cut-off used to determine SCM was 250,000 cells/mL. Cows were grouped by parity (1st, 2nd, ≥3rd), stage of lactation (0-60, 61-120, 121-180, ≥181 days-in-milk) and herd as a whole. SCM prevalence was calculated as the percentage of cows over the cut-off in a monthly report, while chronic SCM prevalence was calculated as the percentage of cows over the cut-off in ≥2 sequent monthly reports. Both SCM and chronic SCM were assessed by herd, parity and stage of lactation. In part two, the body condition score (BCS), the locomotion score (LS) and the proportion of cows at rest ruminating 2 h after feeding (PRC) were assessed monthly during 2019. Moreover, a fresh TMR sample was collected and its chemical composition was measured using a portable NIR analyzer (AgriNIR™, Dinamica Generale, Italy). The particle size of the TMR was evaluated using the Penn State Particle Separator (PSPS). Percentages of particles retained on each sieve and the average particle size (APS) were calculated. Monthly individual milk yield (MY), fat (F) and protein (P) records were available for all cows. Cows with milk F:P ratio <1.0 were considered as at-risk for subacute ruminal acidosis (SARA), while those with F:P ratio >1.4 in the first 30 days-in-milk as at-risk for subclinical ketosis (SCK). Non-parametric pairwise correlation coefficients (spearman's ϱ) were calculated. An overall SCM prevalence of 46% was detected. SCM prevalence in ≥3rd lactation cows was 60%, with 87% of them being chronic cases. SCM prevalence was noticeably high from 1st lactation, affecting 18% of the cows. Half of the cows at ≥181 days-in-milk

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had SCM; almost all of them were chronic. The incidence rate of new infections at 0-60 days-in-milk was 4 times higher than at later stages. Furthermore, the percentage of particles retained on the upper sieve of the PSPS ranged from 3.8% to 24.2%. The PRC was constantly low (range: 32-54%). Individual MY was negatively associated (ϱ=-0.806, P=0.005) with the percentage of cows at-risk for SARA (range: 6.5–25.5%) and with the percentage of lame cows (ϱ=-0.721, P=0.019). The latter was also positively associated (ϱ=0.727, P=0.011) with the percentage of thin cows (BCS<2.5). The percentage of severely lame cows was positively associated (ϱ=0.673, P=0.023) with the dietary starch content. The percentage of cows ruminating was negatively associated (ϱ=-0.688, P=0.019) with the APS of the TMR. The investigation and control of chronic subclinical mastitis, a re-formulation of the TMR and a routine hoof-trimming procedure were considered the major corrective interventions to be implemented in respect to the aim of this study.

Keywords: Udder health; nutritional management; health and milk indices; dairy cows.

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