



content without secondary effects (in the tested range) for kidney metabolism in late-pregnant dairy cow, this way improving the environmental impact.

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C-026

Effect of feeding vitamins and trace minerals to dairy cows after long-term non-supplementation of these nutrients

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Dairy cows are usually fed amounts of vitamins and trace minerals that largely exceed their minimum requirements. This study was conducted at the experimental dairy farm of the University of Bologna and was aimed at evaluating the effect of feeding a vitamin and trace mineral mix to dairy cows that had previously not received any supplementation of these nutrients. Thirty Holstein dairy cows were fed for 8 months a total mixed ratio with no vitamin and trace mineral supplementation. After this period, animals were divided into two groups of 15 cows each (homogenous for milk yield, days in milk and age) receiving for 60 days a total mixed ratio (12.2 kg grass hay, 2.8 kg dehydrated alfalfa, 8.4 kg corn meal, 2.2 kg soybean meal, 0.9 kg molasses, 0.2 kg sodium bicarbonate, 0.1 kg sodium chloride) added or not (control) with a vitamin and trace mineral mix (VTM mix). Control diet met dairy cow minimum requirements for manganese and iron but covered only 50 and 40% of zinc and copper requirements (NRC, 2001), respectively; conversely, all trace mineral requirements were met in cows receiving the VTM mix. Results were analyzed by one-way ANOVA and differences were considered significant for $P < 0.05$. During the whole experimental period, compared with data previously collected at the same farm, incidence of health events was not increased by not supplementing cows with vitamins and trace minerals. Feeding the VTM mix did not influence milk yield and composition. Similarly, plasma total protein, albumin, globulins, lysozyme and haptoglobin concentrations were not affected by diet. After 30 days, haemolytic complement activity was higher (50.0 vs 42.8 CH50/150 μ L; $P < 0.05$) in cows fed VTM mix. Oxidative stress as well as the number of leukocytes in blood did not differ between treatments. Plasma levels of copper and zinc were not influenced by treatment but, after 60 days, plasma iron levels were higher in cows fed VTM mix (28.9 vs 24.7 μ mol/L; $P < 0.05$). These data seem to suggest that feeding high levels of vitamins and trace minerals to lactating dairy cows might have only minor influence on animal productivity and immune status.

C-027

Principal component analysis of milk fatty acid: effect of the different feeding regimens

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Feeding regimen may significantly affect milk fatty acid composition, by modulating both rumen and mammary lipid metabolism. Hence, the aim of the present study was to evaluate milk fatty acid (FA) composition as a marker of the feeding regimen in dairy cow. Individual milk samples of 319 cows were collected from 24 commercial dairy herds (13±4 cows per farm). The animals were selected so as to have individuals homogeneously distributed along the entire period of lactation. Using a standard questionnaire, management and nutritional parameters were recorded. On the basis of questionnaire results, farms were grouped into 4 different feeding regimens: group1 (low level of forage and fat integration), group2 (medium level of forage and fat integration), group3 (high level of forage and fat integration), group4 (high level of forage and no fat integration). Methyl esters of FA were prepared by a direct extraction and alkali catalyzed transmethylation procedure, followed by gas-chromatographic analysis. A reference standard butter was used to estimate correction factors for short-chain FA. Data were analyzed by principal component analysis (PCA) to determine how the feeding regimen of the dairy cows and the composition of the milk were differentiated from each other. Data were analyzed by the GLM, with farm, days in milking, season of calving and diet group as main effects. Significance was declared at $P < 0.05$. The mean value for the different variables was an average of all milk samples and was used directly in the PCA plot. In the present study, production data collected from 24 farms showed a large variation in feed intake between and within the 4 feeding regimens. The first (PC1) and second (PC2) principal component explained 28% and 12% of variation, respectively. The results showed that the different feeding regimens adopted by farmers, were significantly discriminated according to milk FA composition. In particular, the low level of forage is associated with a higher content of n-6 fatty acids and a high level of n-6/n-3 ratio. Fat integration is related to increasing amount of vaccenic acid and CLA (+25%).