

MILK PRODUCTION AND SERUM NON-STERIFIED FATTY ACIDS CONCENTRATION IN PERIPARTUM HOLSTEINS HEIFERS

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In peripartum dairy heifers the body growth added to the fetal development and the beginning of lactation imposes a severe negative energy balance (NEB). This event occurs due the imbalance between the energy intake and the amount of energy needed, and, as a result, peripartum heifers develop a less or more severe NEB. The extent of the NEB can be evaluated by the serum concentrations of non-sterified fatty acids (NEFA). A more severe NEB leads to a higher rate of lipolysis and increased serum NEFA concentrations. NEFA can be deleterious to the immune system, increasing the somatic cell count (SCC) in the milk. Consequently, NEFA is a undesirable metabolite for the mammary gland. The aim of this study was to evaluate serum NEFA concentrations and its relation to milk production in peripartum Holstein heifers. Twenty three pregnant Holstein heifers in average 2 years old were evaluated in a commercial dairy farm in Southern Brazil. The heifers were managed under the same conditions and milked twice daily. Weekly blood collections were performed from 5 weeks pre-partum to 9 weeks post-partum. The NEFA assay was conducted with the colorimetric methodology according to manufacturer's instructions (NEFA-HR®, Wako Chemicals). The heifers that had NEFA concentration higher than 0.9 $\mu\text{Eq/L}$ ($n=17$) at least once, had lower milk production (19.45 L/day) from the second to ninth week of lactation in comparison to the heifers with NEFA lower than 0.9 $\mu\text{Eq/L}$ ($n=6$), which produced 22.64 L/day in the same period ($p < 0.001$). The immunosuppression modulated by NEFA causes an increase in SCC. The affected mammary gland loses its ability to synthesize milk. Thus, the loss of the healthy state of the gland causes a decrease in its function, resulting in reduced milk production. In addition, a higher NEFA concentration indicates a more severe NEB and a decreased energy intake, which also reduces the milk production. In conclusion, higher NEFA concentration in peripartum Holstein heifers decreased the milk production.

Keywords: Dairy heifers, non-sterified fatty acids, milk production