



# Nutritional Indicators in Holstein Dairy Heifers Infected with Respiratory Syncytial Virus with Referring to Changes in Lipid Profile, Tumor Necrosis Factor- $\alpha$ and Acute Phase Proteins

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## Abstract:

In both experimental and natural calf pneumonia serum lecithin:cholesterol acyltransferase (LCAT) activity is reported to decrease, which may be due to involvement of cytokines in respiratory infection. This study aimed to evaluate whether a similar phenomenon occurs in dairy heifers naturally infected with bovine respiratory syncytial virus (BRSV) and, in addition, to assess the relevance of LCAT to other metabolites, including tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ). An outbreak of BRSV infection happened in 12 dairy heifers on a farm and sera were obtained at days 0, 3, 7 (acute phase), 22 (convalescent phase) and 50 (postconvalescent phase). Serum concentrations of haptoglobin (Hp) and  $\alpha$ 1-acid glycoprotein (AGP) were remarkably increased in the acute phase, which reflected the severity of the inflammatory process due to pneumonia. However, they gradually decreased after therapy and returned to normal from day 22. Reduced serum activities of LCAT and increased serum concentrations of TNF- $\alpha$  were also found at days 3 and 7, respectively, compared with the postconvalescent day (day 50). This reduced LCAT activity is considered to be related to the increase of serum TNF- $\alpha$  because TNF- $\alpha$  inhibits the synthesis of mRNA of LCAT in the liver. On the other hand, the significant elevation of the serum apolipoprotein A-I (apoA-I) concentration at day 0 compared with day 50 may suggest that there is also an increased serum Hp concentration because apoA-I has affinity for Hp. The change of serum LCAT activity found in this study is involved with the changes of TNF- $\alpha$ , apoA-I and Hp in inflammatory pathogenesis.

## Keywords:

Lecithin:cholesterol acyltransferase, TNF- $\alpha$ , heifers, syncytial virus, respiratory infection.

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