Effects of 2, 4- thiazolidinedione on milk fatty acid profile and serum vitamins in dairy goats with subclinical mastitis

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Short title: **2, 4- thiazolidinedione in fatty acid profile and vitamins during subclinical mastitis**

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SUMMARY

The study included two experiments: 1) twenty-four Saanen lactating dairy goats receiving low-energy diet without vitamins supplement. Six goats in each group received a daily IV injection of 2,4-TZD or saline (**CTR**). A week later, goats were challenged with intramammary infusion (**IMI**) of saline or *Streptococcus uberis*. In experiment 2, twelve Saanen lactating dairy goats received supplemental vitamins to reach NRC recommendation level. Six goats in each group were injected with 2,4-TZD or saline daily, followed by an IMI of *Streptococcus uberis* 14 d later. The hypotheses were 1) the level of retinol and its metabolites is lower in the first vs. the second experiment and that 2,4-TZD treatment does not affect their level in serum, and 2) the fatty acid profiling is affected by mammary infection and 2,4-TZD in poorly fed goats. Milk and serum samples were obtained and analyzed for retinol, α-tocopherol and fatty acid profile. Data were analyzed using the Proc Mixed of SAS and the initial day measurements were used as covariance. Significance was declared at $P \leq 0.05$. The Experiment 2 had higher serum retinol and β-carotene concentration compared to Experiment 1. The serum lipophilic vitamins were affected by TZD×Time interaction in higher β-carotene and α-tocopherol than CTR in Experiment 1. In addition, TZD×Time interaction showed that the milk fatty acid were affected by 2,4-TZD in C16:0 reduced by 2,4-TZD while C18:3 n3 and total omega 3 fatty acid were increased by 2,4-TZD, as well as with only a minor effect on preventing momentarily increase in α-tocopherol in milk. Overall, data revealed the well-fed and TZD×Time increased lipid-soluble vitamins and modified some of the long chain fatty acids in the serum and milk.