

# Relationships of Blood-based Indices of Liver Function During the Transition Period with Performance and Health in Dairy Cattle

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## Introduction

All cows undergo physiological and metabolic changes in the periparturient period that help the cow adapt to lactation (Trevisi and Minuti, 2018). These changes can promote inflammation and when they are dramatic or prolonged, can lead to poor health status and performance (Bertoni and Trevisi, 2013). A diagnostic system using blood metabolites was developed by Bertoni and Trevisi (2013) to determine health status. The liver functionality index (LFI) however, with multiple timepoint sampling limited its potential for field use, and a single time point early in lactation would have more practical use in the field. The objective was to compare the proven liver functionality index to a novel liver health index (LHI) (Gallagher et al., 2019) and characterize relationships of liver health with transition period outcomes.

## Results

Cows that had high LFI and LHI tended to have higher milk yield in the first 12 weeks postpartum than cows with low LFI and LHI (Figures 1 and 2, respectively). Those cows with high LFI and LHI also both had significantly lower concentrations of haptoglobin (Hp) (Figures 3 and 4, respectively), as well as have lower concentrations of non-esterified fatty acids (NEFA) compared to cows with low LFI and LHI (Figures 5 and 6, respectively) in the first two weeks postpartum.

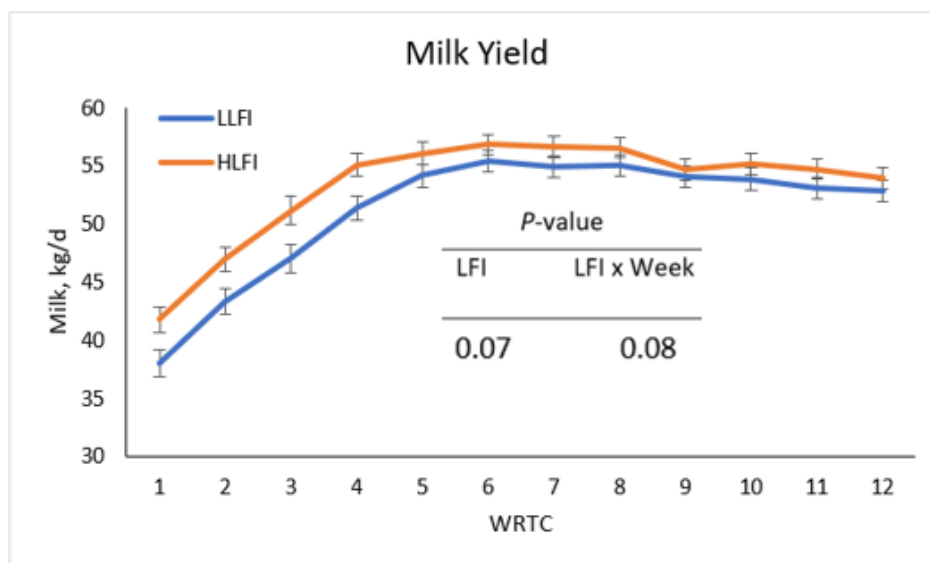


Figure 1. Milk yield of low and high LFI in the first 12 weeks postpartum.

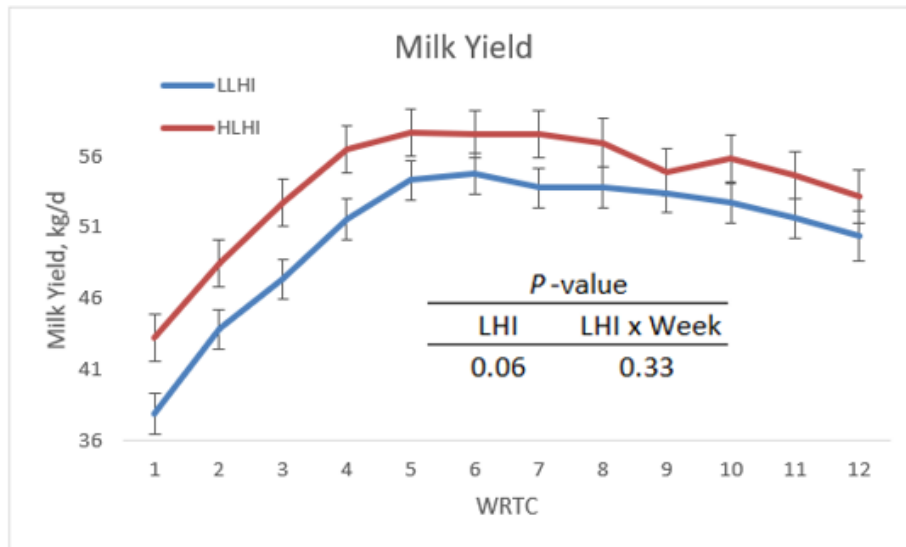


Figure 2. Milk yield of low and high LHI in the first 12 weeks postpartum.

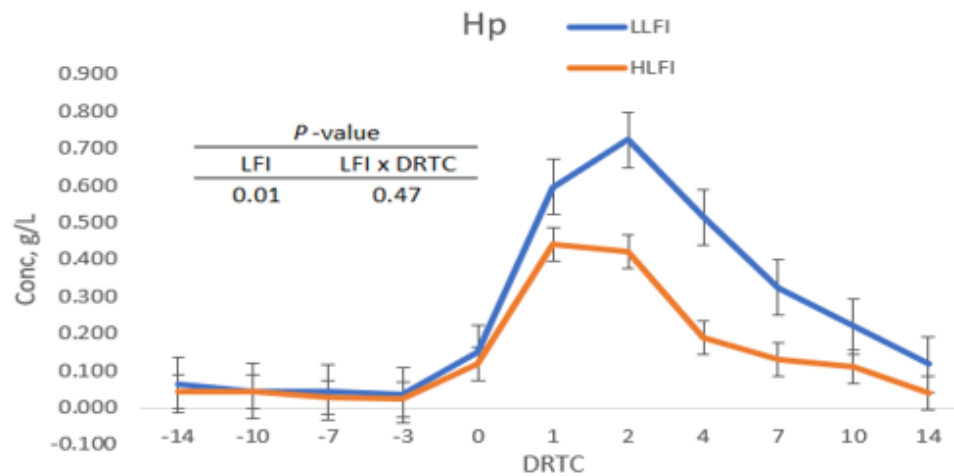


Figure 3. Haptoglobin concentrations of low and high LFI in the transition period.

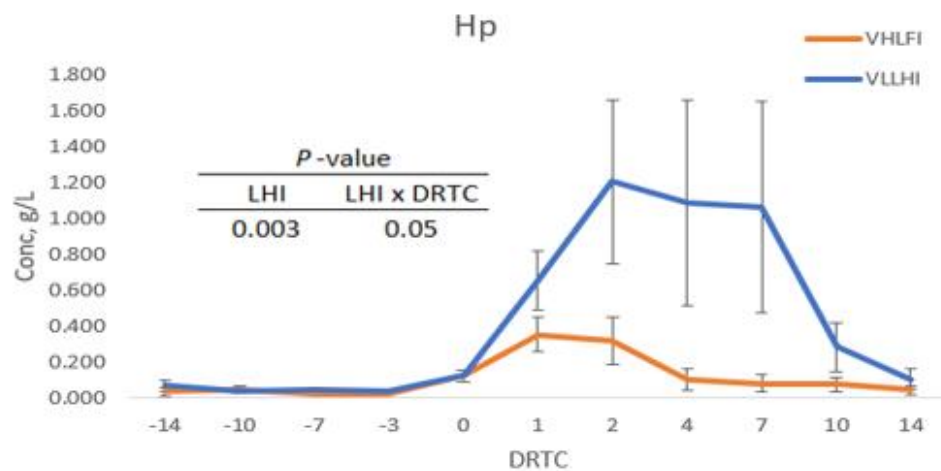


Figure 4. Haptoglobin concentrations of low and high LHI in the transition period.

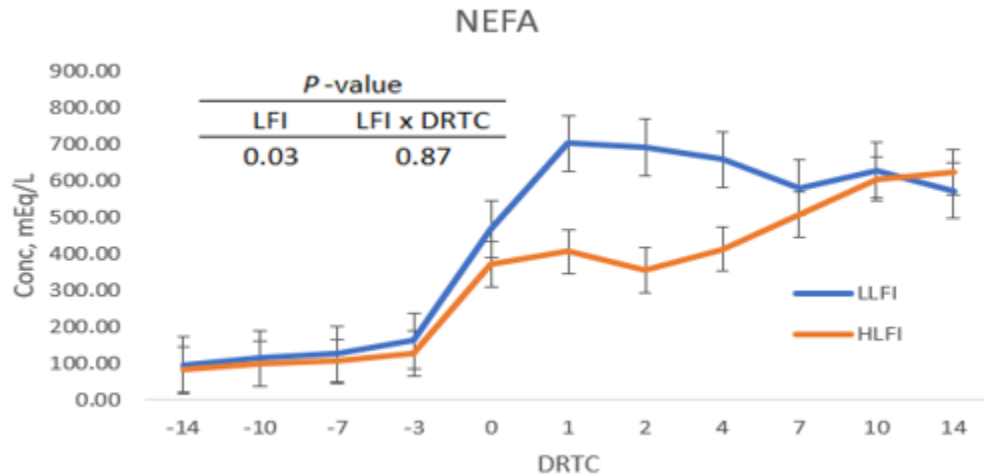


Figure 5. NEFA concentrations of low and high LFI in the transition period.

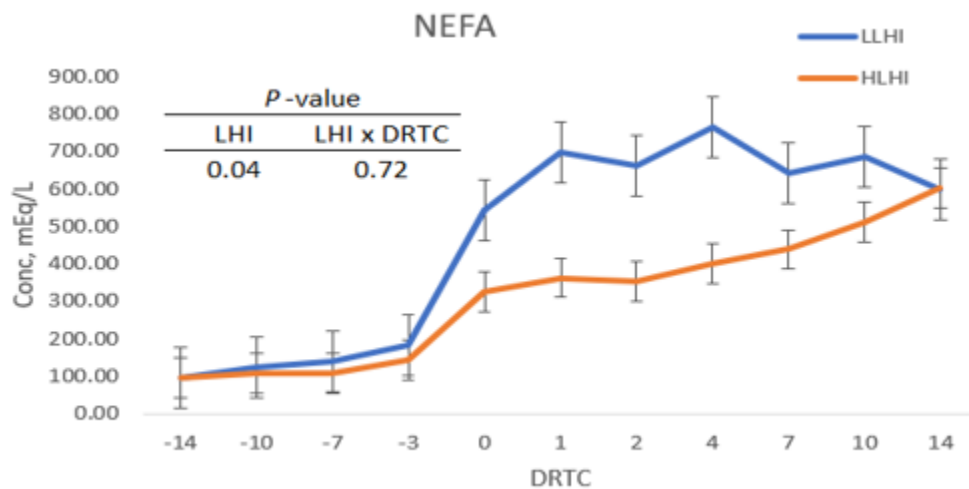


Figure 6. NEFA concentrations of low and high LHI in the transition period.

### Summary and Implications

Overall LHI can be a more practical measure of potential performance than LFI due to less sampling and earlier determination in the lactation. Periodically taking samples to benchmark transition period would be recommended to assess the overall liver health of a herd. We still need to establish a reference to compare results between herds and regions. It can be a simple way for progressive producers and advisors to analyze their transition performance overall.

### References

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