

Association of BCS with backfat & longissimus dorsi muscle thickness in transition Holstein cows

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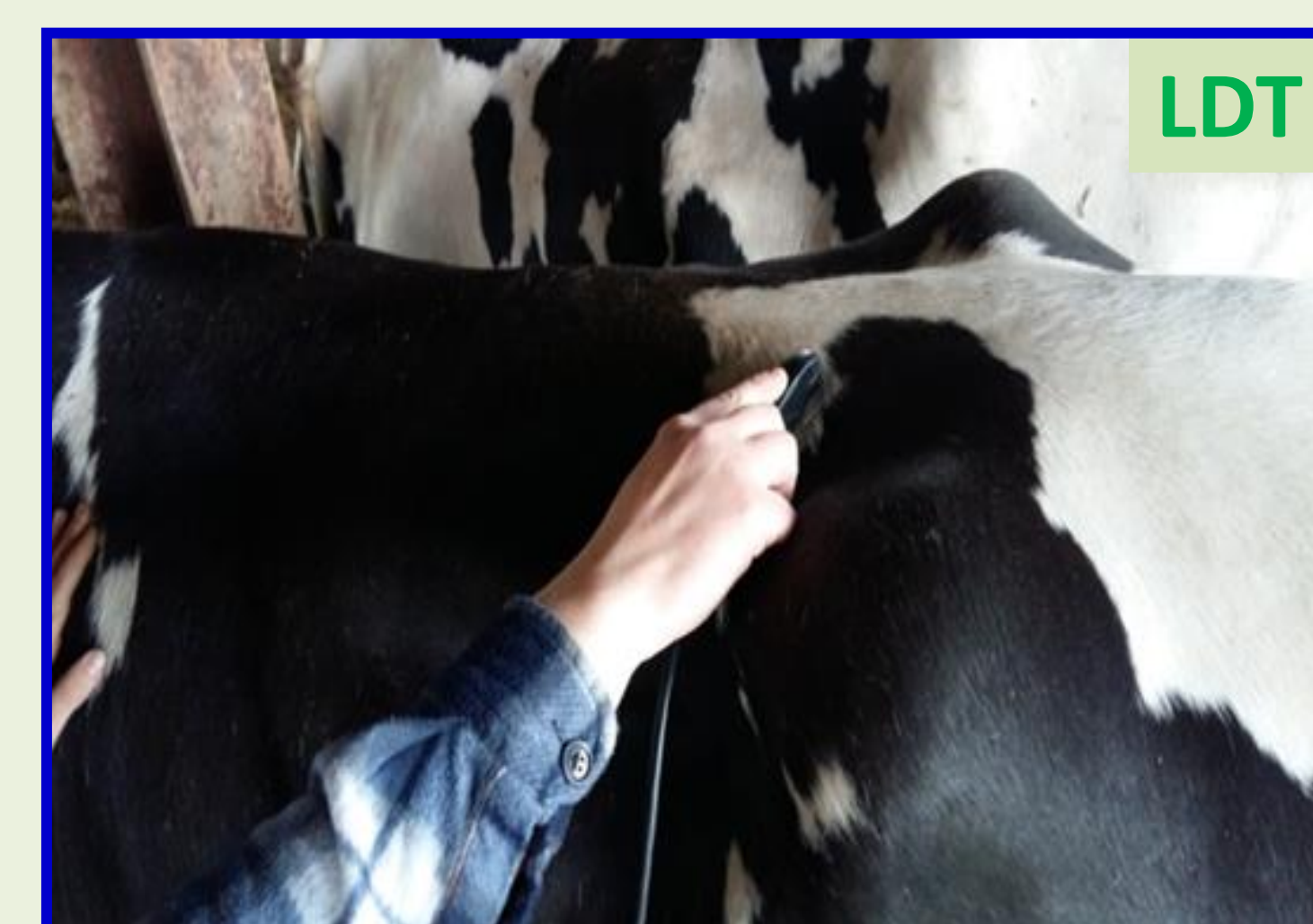
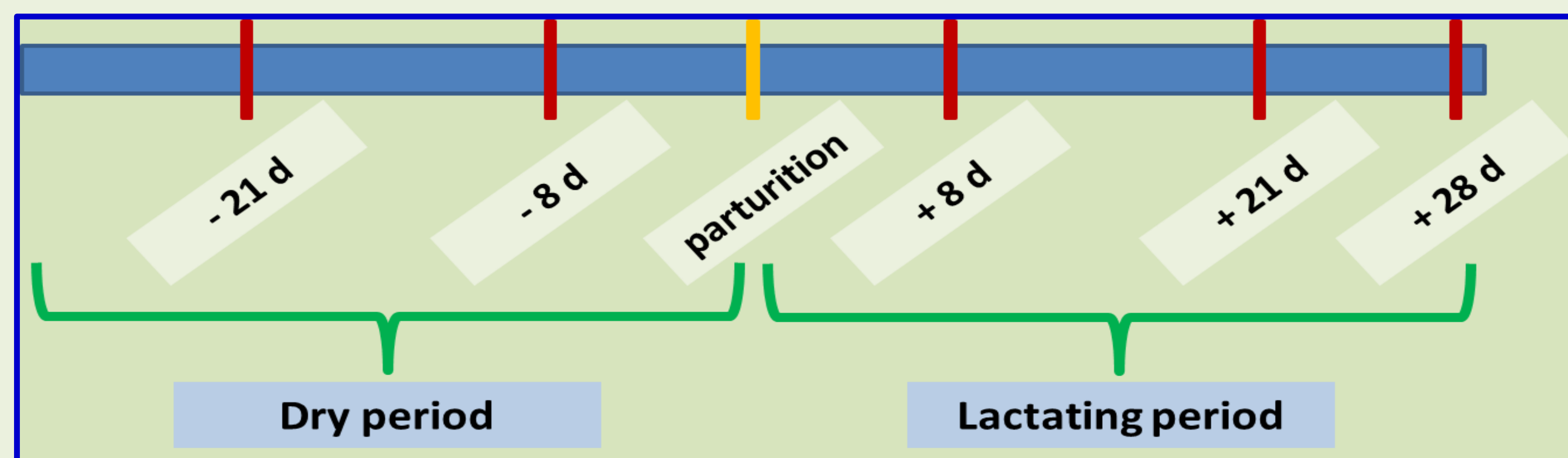
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OBJECTIVE: To assess the relationship of body condition score (BCS) with ultrasound measurements of backfat and longissimus dorsi muscle thickness (BFT & LDT) in transition Holstein cows.

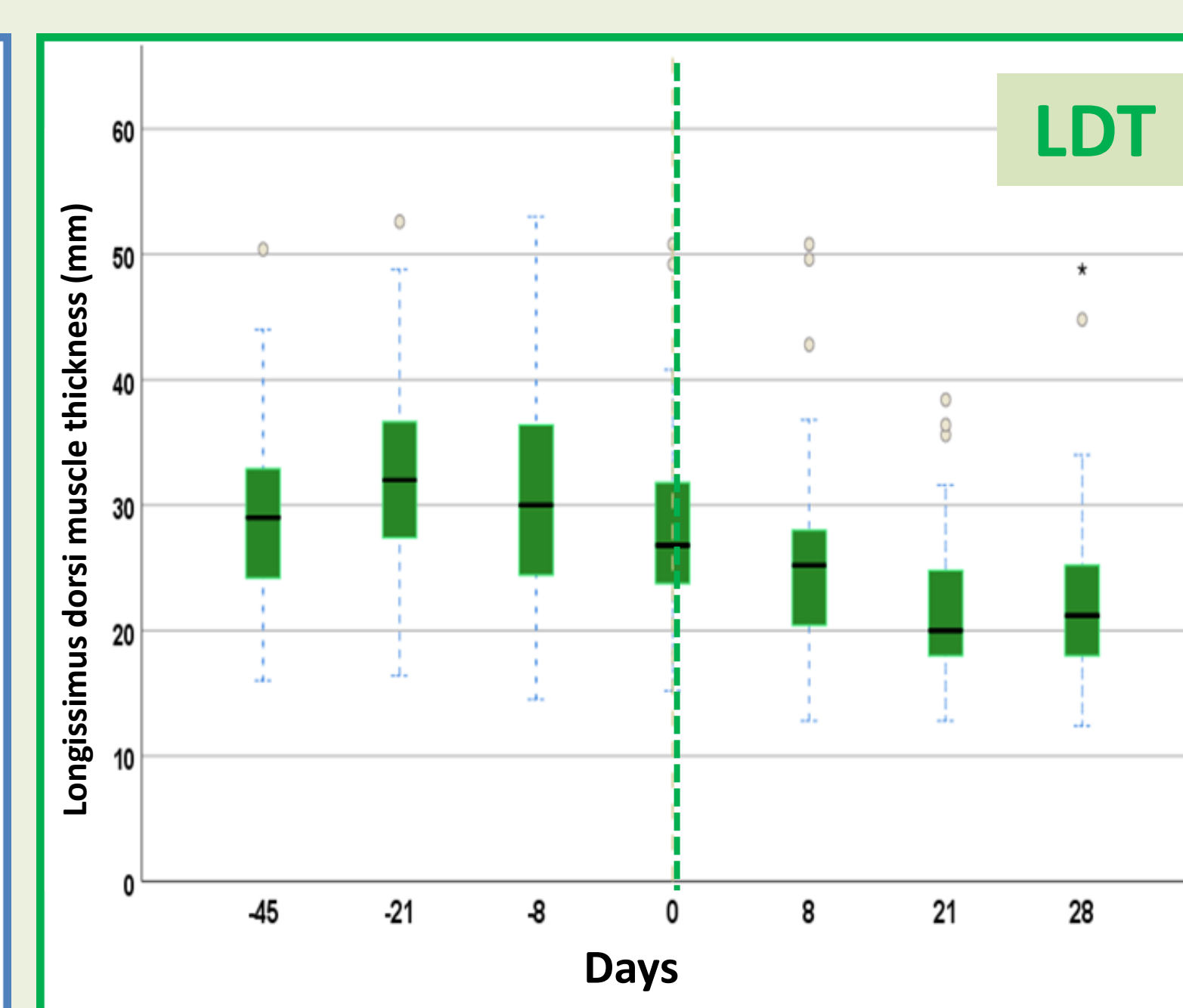
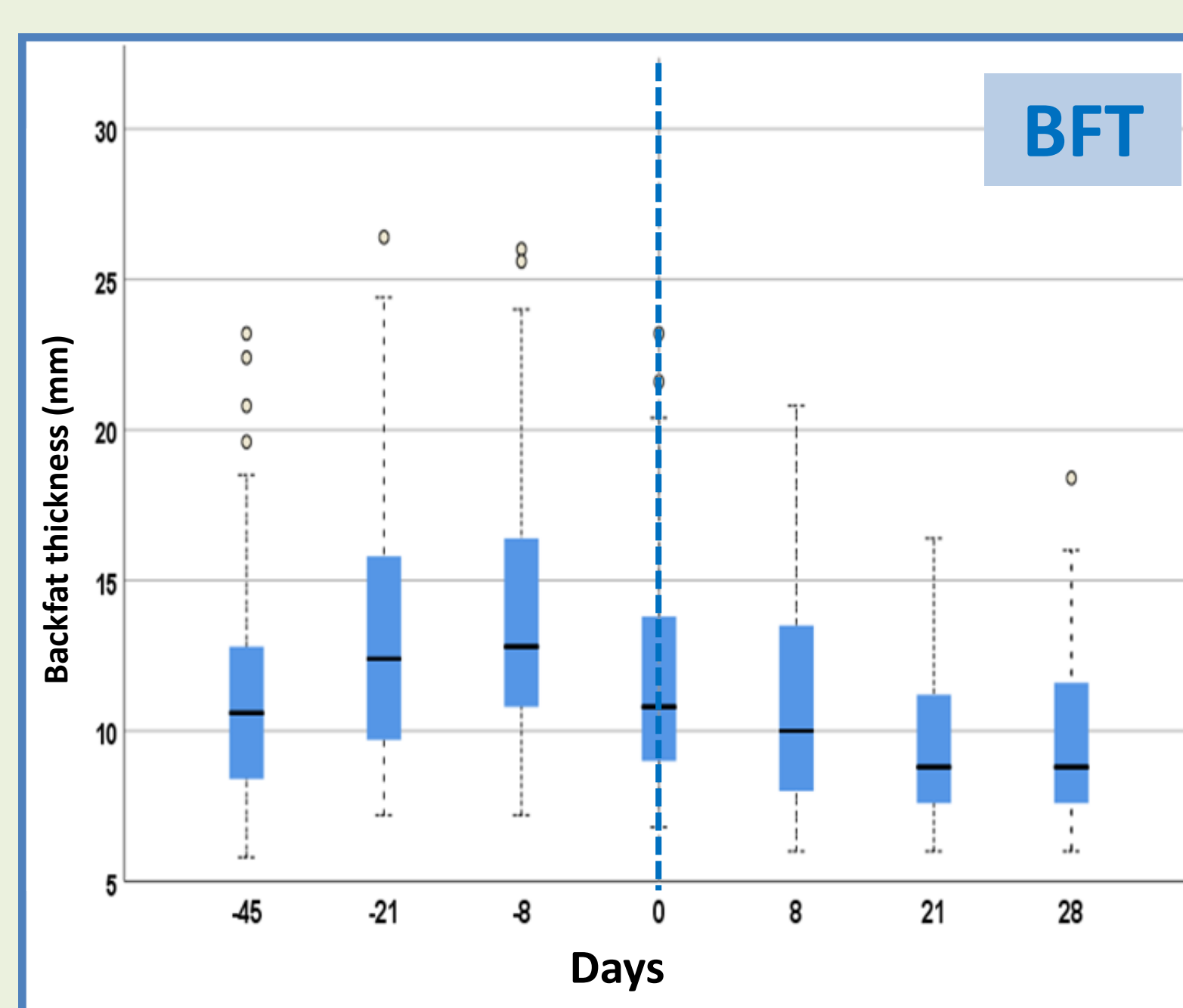
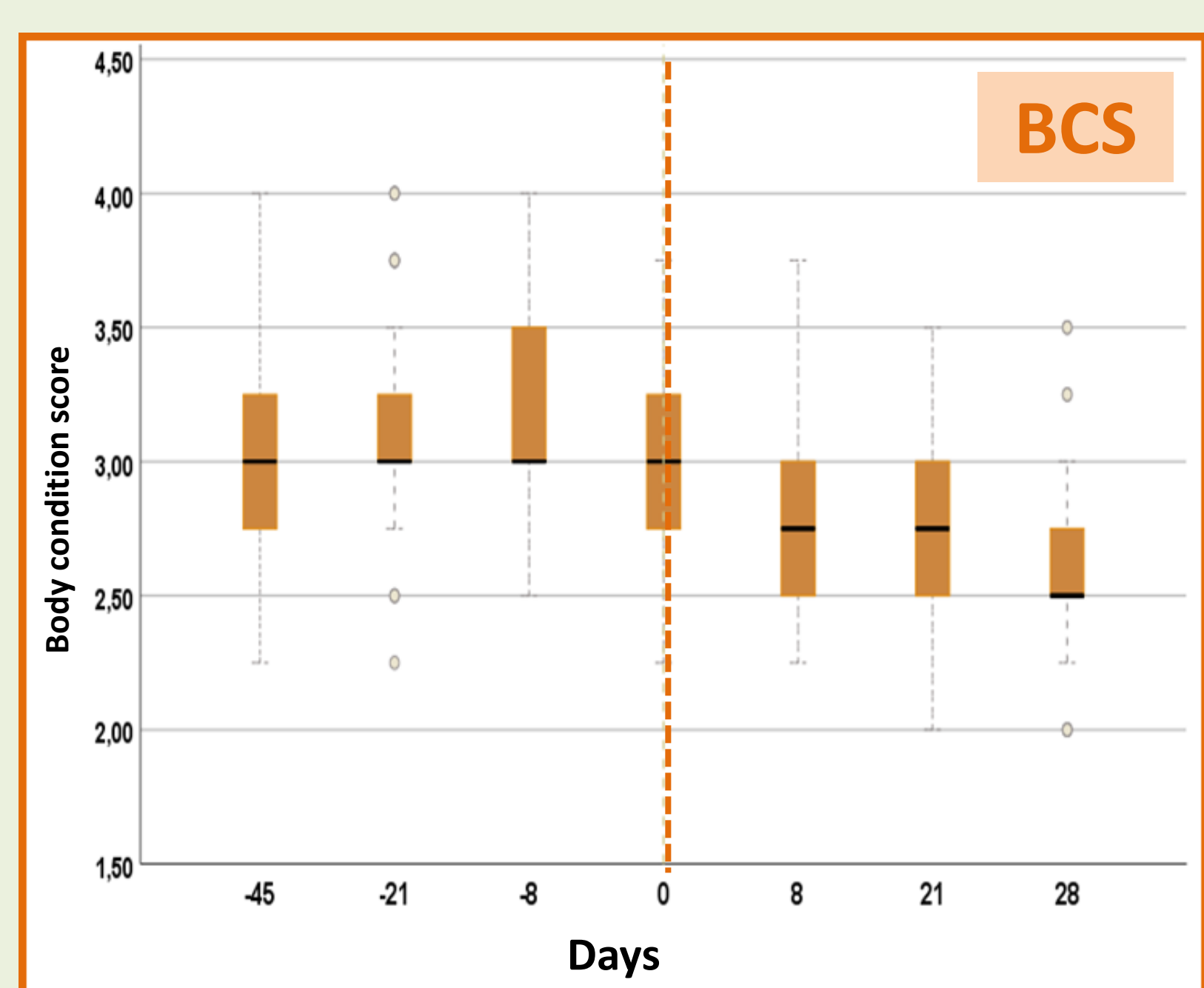
MATERIALS AND METHODS

- 85 Holstein cows from 2 dairy herds ($n=32$ & $n=53$) in different parities (1st: $n=14$; 2nd: $n=35$; ≥ 3 rd: $n=36$)
- BCS assessment [1-5 scale/0.25 increments (Ferguson et al., 1994)]
- BFT & LDT ultrasound measurements (5-7.5 MHz linear transducer)
- 6 time-points across the transition period – a total of 488 measurements



- Pairwise linear correlation & regression analyses for BCS, BFT & LDT
- Multivariate linear regression → effect of BFT & LDT on BCS
- Automatic linear modeling function → predictor importance of BFT & LDT

RESULTS



- Overall pairwise correlations → BCS/BFT, $r=0.831$; BCS/LDT, $r=0.695$ & BFT/LDT, $r=0.570$; all significant at $P<0.001$
- BFT & LDT related quadratically to BCS ($R^2=0.717$ & 0.483 , respectively, $P<0.001$)
- Model with BFT & LDT combined explained better the variation in BCS ($R^2=0.768$, $P<0.001$)
- BFT had higher predictor importance (0.79) compared to LDT (0.21)
- BCS/LDT correlation was higher than BCS/BFT one in primiparous cows ($r=0.789$ & 0.698 , respectively); the opposite was the case for multiparous cows ($r=0.702$ & 0.848 , respectively)

CONCLUSION

- Both BFT & LDT significantly affected BCS estimates in transition Holstein cows.
- At the same BCS, primiparous cows have lower fat & higher muscle reserves than multiparous ones, thus requiring a different nutritional management, both pre- and post-partum.