NO SIMPLE RELATIONSHIP BETWEEN DRY PERIOD AND EARLY LACTATION RESPONSES OF PLASMA NON-ESTERIFIED ACIDS TO IN VIVO b-ADRENERGIC CHALLENGE IN HOLSTEIN FRIESIAN COWS

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Introduction: In early lactation, cows that mobilise excessive amount of body lipids have a higher risk of production diseases. Being able to identify such cows before they calved would be a valuable management aid. This study examined the potential of b-adrenergic challenge for this purpose. The aim was to evaluate the relationship between response of NEFA in the dry period and both basal and response of NEFA in early lactation.

Material and methods: The data used in the analysis were from a five year on-going experiment carried out at research farm Ammitsbøl Skovgård, Denmark. Holstein Friesian cows in parity 1,2 or 3 were housed throughout the year and fed total mixed rations. 130 lactations were included in the dataset. 0.4 mg/kg BW of adrenaline was injected on the Thursday nearest days -14, 21, 70 and 252 relative to calving. Blood samples were taken for basal plasma NEFA determination immediately before injection and exactly ten minutes after to determinate the stimulated value. Response was calculated as the difference between stimulated and basal plasma NEFA. Factors affecting early lactation basal NEFA and response were quantified in a mixed model including dry period response and parity and their interaction as fixed effects and cow as a random effect.

Results: As shown in Fig 1, there was a characteristic pattern ($P<0.001$) of response through lactation. This pattern was more pronounced in older cows ($P<0.01$). The relationship between response in dry period and basal NEFA in early lactation was tested and found non-significant ($P=0.17$ Fig 2). There was no significant relationship between response in dry period and response in early lactation ($P=0.65$). The intercept of these relationships was significant affected by parity ($P<0.05$) but the slope was not affected.

Conclusion: On its own, adrenaline response in the late dry period was not a sufficiently strong predictor of basal NEFA and response in early period to provide a simple diagnostic to detect cows at risk of abnormal mobilisation.

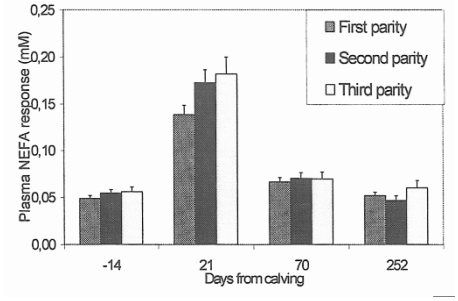

Fig 1. Mean values and standard errors of NEFA response during four periods in lactation affected by parity.

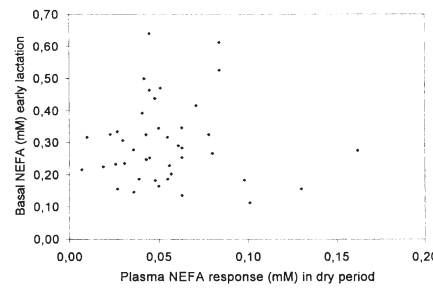

Fig 2. Relationship between dry period response and early lactation basal NEFA shown for 2nd parity.