Non-invasive Biomarkers for Health and Metabolism in Dairy Cows

Abstract

In early lactation, dairy cows suffering from a negative energy balance (**NEB**) status mobilise their body reserves to meet the increased nutrients requirement. Previous studies showed cows with omitting or shorting dry period (**DP**) had greater energy balance (**EB**) than conventional DP (60 days). The objective of this study was to investigating profiles of amino acids and acyl-carnitine in blood and milk for dairy cows in NEB, and further identifying non-invasive biomarkers diagnosing NEB and metabolic disorders. In our study, 120 Holstein-Friesian dairy cows were divided into 3 groups, 0 day DP and diet with 84% energy level, 0 day DP and diet with 100% energy level, and 30 days DP and diet with 100% energy level. Milk yield and feed intake were recorded daily and energy balance (EB) was determined weekly. Blood and milk were also sampled weekly. And 1H Nuclear Magnetic Resonance and Triple Quadrupole MS were used to measure the metabolite profiles in milk and blood. Initial results showed that cows with 0 day DP had a lower milk yield, but a better EB and metabolism state than cows in 30 days DP.