Abstract for Paper to be presented at WHFF 2023, Puy du Fou, France

November 21/22, 2023

Session 3. New trends and traits for the future

Breeding for resilience in the Netherlands and Flanders by Niek Meijer

Dairy cows could face several environmental disturbances during a lactation, resulting in a reduced functioning. Many of these environmental disturbances, like weather conditions or changes in roughage quality, cover the entire herd, but not all cows have the same degree of reduced functioning. Cows which are minimally affected by disturbances and/ or quickly recover are the preferred cows. Reduced functioning of dairy cows is measured as the difference in daily milk yield and the expected milk yield for that day. This is called deviation. The expected daily milk yield is estimated with polynomial quantile regression based on all milkings of a cow during a lactation. Based on the deviations, two resilience traits are calculated: stability and recovery. Stability is the natural logarithm of the variance (LnVar) from all deviations during a lactation, recovery is the autocorrelation (Rauto) between all deviations during a lactation. A lower LnVar indicates less affection by disturbances, a lower Rauto indicates quicker recovery. Breeding values are estimated for stability and recovery for lactation 1, lactation 2 and lactation 3 and later (3+) with a distinction between cows milked by an automatic milking system (AMS) or milked in a milking parlour (EMM). In total, twelve traits are estimated. Heritability (h^2) based on AMS milkings is 0.09, 0.06 and 0.09 for stability and 0.07, 0.04 and 0.04 for recovery for respectively lactation 1, 2 and 3+. Based on EMM milkings, h^2 is 0.05, 0.05 and 0.04 for stability and 0.04, 0.03 and 0.02 for recovery for respectively lactation 1, 2 and 3+. Genetic correlations between different parities for stability ranges from 0.91 to 0.98 and for recovery it ranges from 0.84 to 1.00. Within lactations, genetic correlations between stability based on the different milking systems ranges from 0.88 to 0.91 and for recovery it ranges from 0.35 to 0.76. Overall breeding values for stability and recovery are calculated based on traits in lactation 1, 2 and 3+ from AMS milkings. The traits from EMM milkings serve as indicator traits. An overall index for resilience is calculated based on the overall breeding values for stability and recovery. Breeding on resilience results in cows that are less affected by environmental disturbances and recover more quickly. The overall index and the two overall breeding values are the traits that will be published in the Netherlands and Flanders from April 2024.