Abstract #M95

Section: Breeding and Genetics
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Association of a polymorphism in the paraoxonase 1 (*PON1*) gene with reproductive performance, health and production of Holstein cows.

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Paraoxonase 1 (PON1) is a negative acute phase protein associated with uterine health conditions in postpartum dairy cows and may affect reproductive performance. Recently, a single nucleotide polymorphism (SNP) was found in the promoter of the *PON1* gene in dairy cows associated with serum PON1 activity. The aim of this study was to evaluate the association of the *PON1*(A/G)-221 SNP with reproductive performance, disease incidence and milk production in Holstein cows. For the study, 85 Holstein cows were followed from 21 d prepartum to 210 d in milk (DIM). For SNP identification DNA was extracted from blood and the tetra primer ARMS-PCR technique was used. The primers produced a control 700 bp product, and smaller specific products of 500 bp (allele A) or 200 bp (allele G). After gel electrophoresis it was possible to genotype all cows and some were confirmed by sequencing of the products. At 55 DIM the cows were submitted to an OvSynch-TAI protocol, which was repeated in cows diagnosed as not pregnant. From calving, milk production was recorded, milk samples for progesterone measurement were collected twice a week to determine ovulation day until 60 DIM, and disease incidence, the number of inseminations/pregnancy (AI/P) and the calving- conception interval (CCI) was evaluated. Data were analyzed using the GLM procedure of SAS and by survival analysis and Chi-squared on GraphPad Prism. After genotyping, we detected 57 cows (67.0%) of the AA genotype, 20 cows (23.6%) of the AG genotype and 8 cows (9.4%) of the GG genotype. Cows of the GG and AG genotype ovulated earlier than AA cows (27.6 ± 2.9 and 32.1 ± 2.2 DIM, respectively; $P = 0.02$). There was no difference between genotypes for milk production, number of AI/P or CCI ($P > 0.05$). Also, there was no difference for the occurrence of disease (metritis and mastitis) between the 3 genetic groups ($P > 0.05$). Therefore, the presence of at least one G allele at the position −221 of the *PON1* gene is associated with an earlier postpartum ovulation, although more studies on the mechanism for this effect are needed.

Key Words: *PON1*, SNP, dairy cow