ANALYSIS OF CONVENTIONAL AND SEX SORTED SEMEN QUALITY AND PREGNANCY RATES IN ABERDEEN ANGUS AND HOLSTEIN FRIESIAN HEIFERS IN CHILE

José Luis Riveros F.1, Jennie Risopatrón G.2, Raúl Sánchez G.2, Karen Arrivé C.1, Ricardo Felmer D.1

1Laboratorio de Biotecnología Animal INIA-Carillanca, INIA- National Agricultural Research Institute, 2Centro de Excelencia de Biotecnología de Reproducción CEBIOR, Universidad de la Frontera, Temuco, Chile

Flow cytometry-based sperm sexing has undergone improvements in throughput and sort efficiency since implemented 20 years ago. Alongside the technical improvements in flow cytometry, there have been significant developments allowing sorted sperm to be cryopreserved and utilized for in vitro embryo production and low dose AI. In the current approach, sperm are prepared with a DNA-specific stain and excited by a UV laser for DNA content measurement with a sexing success near to 90%. Sorting process allows selection and sexing however decreases sperm viability. This effect could be related to sperm apoptosis, decreasing integrity membrane and transport capacity, which have been associated with low pregnancy rates. Thus, the objectives of this study were to characterize conventional and sex sorted semen quality and to evaluate the effects on pregnancy rates. To our knowledge, this is the first characterization of semen quality of most popular breeds in beef and dairy systems in Chile. Semen doses used for this study came from two bulls (AA: Aberdeen Angus and HF: Holstein Friesian) and two lots (C: conventional and SS: sex sorted) collected on one reproductive season. Sex sorting effects were compared between C and SS lots of each breed related to sperm DNA fragmentation, mitochondrial membrane potential, plasma membrane translocation and acrosome integrity. C and SS doses were used to inseminate 24 AA and 24 HF healthy heifers, which were synchronized with one injection of PGF2α, previous detection of corpus luteum by ultrasound. Estrus was monitored for 72h after induction and heifers were randomly inseminated (C or SS lots) 8-12 hours after estrus detection. Pregnancy was detected by ultrasound on d40 after AI. Results are presented by breed. AA SS semen showed higher DNA fragmentation (p< 0.003) and lower mitochondrial membrane potential (p< 0.036) than C semen and pregnancy rate was 67% (C) 58% (SS). Similarly, HF SS semen presented lower acrosome integrity (p< 0.037) and lower mitochondrial membrane potential (p< 0.004) than C semen and pregnancy rate was 58% (C) and 42% (SS). These results suggest that changes in sexed sperm quality could be related to the sex sorting process and the lower fertility observed in vivo. To our knowledge this is the first characterization of commercial sex sorted semen quality and pregnancy rate in vivo in Chile. Further studies are necessary to conclude if decreased sex sorted sperm quality is determinant on pregnancy rate.