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Rachel Lefebvre, Sebastien Fritz, Dorothee Ledoux, J. Gatien, Lucie Genestout, Marie-Noelle Rossignol, Didier Boichard, Bénédicte Grimard, P. Humblot, C. Ponsart

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**GENIFER: fine mapping and effects of QTL affecting fertility in Holstein cattle**

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The GENIFER project was built to confirm some fertility QTL, fine mapping and precise effects thanks to monitoring events between 0 and 90 days after first insemination (AI). Phenotyping involved 4559 Holstein cows born from 12 sires and located in 1028 farms. Combining progesterone assays at day 0 and 21, pregnancy diagnosis at day 40 and 90, and subsequent calving informations lead to determination of the time of pregnancy failure at first AI and to the following diagnostics: inappropriate time of AI, no fertilization or early embryonic mortality, late embryonic mortality, total embryonic mortality, fetal mortality, abortion or lack of calving. Genetic analysis included 2669 females with clear phenotype and genotyped for 353 SNP chosen in 16 regions of 13 chromosomes (1-6, 9, 10, 14, 15, 18, 26, 27). These regions were selected based on previous QTL mapping results from a large granddaughter design. QTL were detected by association analysis with Fasta method and GenABEL package of R software. The main QTL targeted in this study, located on chromosome 3, was confirmed and its location was refined around 24 cM. Its maximum effect appeared on late embryonic mortality, whereas an effect on early mortality and abortions was not excluded. 2 to 8 QTL were confirmed ( $p < 0.01$ ) for each trait : 6 for calving rate, 3 for no fertilization or early mortality, 3 for late embryonic mortality, 8 for total embryonic mortality, 2 for fetal mortality and 3 for abortion.