Abstract Submission Form

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Preferred presentation

Oral

Preferred session

Session 1: WG Animal Data Exchange – Decision Support Tools of the Future – Promoting Sustainability Farm Management

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Title of your paper   Optimization of dairy herd replacements combining conventional, sexed, and beef semen in mating programs

Insert ABSTRACT text

Farmers have often an abundance of replacement heifers in their herds due to increasing use of sex-sorted semen and genomic tools. Given the current Italian market conditions, rearing more heifers than needed is not a profitable strategy. On the other hand, the higher market value of crossbred dairy calves is an attractive strategy for dairy farmers. The aim of this study was to develop a tool to help Italian dairy farmers identify the annual female replacement needs to optimise economic outcome of the dairy herd. The approach is based on herd performance and combination of different semen types (conventional, sex-sorted, and beef semen), with the ultimate goal of enhancing farm profit. A case study based on a 350-cow Holstein herd was used and 3 levels of herd fertility (high, medium, and low) were simulated to define the required yearly number of dairy female replacements and the number of females yielded under different scenarios of semen utilization. The number of annual dairy replacements was obtained as the number of cows multiplied by the replacement rate, adjusted by the age at first calving, and the number of

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animals yielded was derived by semen type utilization, calf and heifer mortality, pregnancy losses, and calving interval, and it was used to evaluate the replacement cost per 100 L of milk. The latter was calculated from all costs incurred from birth to first calving of all females yielded minus revenues from selling cull cows, heifers, dairy male calves, and calves from beef when beef semen was used, and dividing the result by income from 100 L of milk sold. Then, four strategies of sexed semen utilization were combined with five strategies of beef semen use. Animals that were not inseminated with sexed or beef semen were bred with conventional semen. Regardless of fertility level, the required number of dairy female replacement heifers were 110. Increasing beef semen use allowed to yield less replacement heifers. Furthermore, as beef semen use increased and the number of replacement heifers decreased, replacement cost per 100 L of milk reduced. Our results suggested that replacement costs increase with increasing number of yielded heifers. Hence, combining beef and sexed semen to reach heifer balance close to zero, decreased the replacement cost. Farmers should choose the strategy that allows them to reach the annual heifer replacement needs, considering the effects of fertility. Once obtained, they should select the scheme that decreases the replacement cost. The tool will be implemented into ANAFIBJ online mating program and used prior to select which heifers or cows to mate with a given bull to enhance herd genetic potential, decrease inbreeding, lower GHG emissions and to provide farmers an approach to identify the best replacement strategy.