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Effect of mating strategies on genetic and economic outcomes in a Montbéliarde dairy herd*M. Berodier^{1,2}, M. Brochard^{1,3}, C. Dezetter⁴, N. Barville⁵ and V. Ducrocq²*

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This study compared the genetic and economic evolution of a 77-cow Montbéliarde dairy cattle herd after 15 years of simulation including 10 years with 8 different mating strategies: with or without genotyping of all female dairy calves combined with or without use of sexed semen and combined with or without use of beef semen. A mechanistic, stochastic and dynamic model was used to mimic the farmer's decisions and individual cow's biology. Females true breeding values for milk yield, fat content, protein content, fertility, longevity and udder health traits influenced production, reproduction, health and culling of the animal. For scenarios with sex semen, the best heifers and 1st lactation cows on breeding objective (calculated as a linear combination of the 6 traits modelled) were inseminated with sexed semen to guarantee replacement with genetically better females. For scenarios allowing beef cross, the worst cows on breeding objective were inseminated with beef breed semen to obtain higher economic value from calves. After 10 years of alternative mating strategies, variations in genetic gain (+12% to +19%) and gross margin (+40% to +49%) show a clear advantage for the scenarios using sexed semen and no beef semen compared to the scenario without female genotyping and with conventional semen only. However, those scenarios require much larger total expenses and strongly increase the number of heifers to be reared. Therefore, it is highly dependent on economic assumptions, especially on the price of 'ready-to-calve' heifers. The scenario using sexed semen, beef semen and female genotyping performed better than the scenario with conventional semen only and without female genotyping. It allows important genetic gains at herd level and a diversification of the sales when market conditions fluctuate.