

Impact of Genomic Selection on the Evolution Breeding Program

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The implementation of genomic selection in dairy cattle has generated many changes in the design of breeding programs as well as in the organization of AI breeding companies. The acceptable reliability obtained on a large number of traits whatever their heritability, for males as well as for females, turns upside down the typical selection programs used for more than 50 years. The birth in 2013 of Evolution, a new French AI company merging the Amelis and Creavia cooperatives and marketing 5 million doses a year in France and abroad, is directly linked to this technological breakthrough. Its Holstein breeding program is now completely based on genomic evaluation for the selection of best candidates and involves more than 3,200 females and 3,000 males genotyped every year. Somewhat overlooked in the past, the female pathway becomes strategic with 720 elite cows selected as potential bull dams. More intense selection entails production of more progeny from the best females, especially heifers, through an

increase in the number of ovum pick-ups and embryos transferred. The objective set by Evolution is to produce and transplant 8,500 embryos every year. To improve the management of genetic variability, more than 130 distinct sires of sons are mated with elite bulls dams, of which 90% are young bulls themselves. Selection intensity on bulls used AI - about 3.5% - is as crucial as before, and aims at marketing 150 new young bulls every year. This ambitious program requires a strong partnership with the breeders, which guarantees both the development of their genetics and the economic sustainability of their herd. As an example, Evolution proposes stations for donor cows and a network of recipient cows available for the multiplication of elite cows. Genomic selection in dairy cattle has become a real race against the clock with more intense competition. On top of the acknowledged higher genetic gain permitted by genomic selection, new challenges lie ahead regarding research and inclusion of new traits.