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### **Is it possible to increase the efficiency of *in vitro* embryo production in Holstein preselecting donors with more oocyte production?**

**J.G.V. Grázia<sup>1</sup>, E.K.N. Arashiro<sup>2</sup>, M.P. Palhão<sup>2</sup>, L.S.A. Camargo<sup>3</sup>, C.A.C. Fernandes<sup>2</sup>, J.H.M. Viana<sup>3</sup>**

<sup>1</sup>Universidade Federal de Juiz de Fora, Juiz de Fora, MG, Brasil; <sup>2</sup>Universidade de Alfenas, Alfenas, MG, Brasil; <sup>3</sup>EMBRAPA Gado de Leite, Juiz de Fora, MG, Brasil.

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The commercial availability of sex-sorted semen resulted in a significant increase of *in vitro* embryo production (IVEP) in dairy breeds. Despite the lower oocyte production (Palhão et al., 2011), cleavage rates, and embryo production (Grázia et al., 2012) than in zebu dairy breeds, there is a great interest in the use of IVEP in Holstein. The present study aimed to evaluate whether the selection of donors based on the production of cumulus-oocyte complexes (COC) can compensate the lower IVEP efficiency in this breed. Data from follicular aspiration and *in vitro* cultures performed in Gir (N = 266) and Holstein (N = 270) donors from 2011 to 2013 in the same IVPE laboratory were used. Data were analyzed by ANOVA and differences between groups were compared by Tukey's test. Percentage differences were compared by Chi-square test. The results are shown as mean  $\pm$  SEM. As expected, the average of total COCs production and number of viable COCs were higher in Gir than in Holstein donors (19.1 $\pm$ 0.9 and 11.6 $\pm$ 0.6 vs. 13.3 $\pm$ 0.6 and 6.8 $\pm$ 0.3, respectively; P < 0.0001) and the total embryo production rate was also higher in Gir breed (55.1% $\pm$ 0.01% vs. 36.3% $\pm$ 0.02%). The percentage of IVEP batches with 40 to 100% of embryo production was also higher in Gir (68.7% vs. 39.2%) than in Holstein donors (P < 0.05). In Holstein, correlations between total oocytes recovered or total viable oocyte and embryo production rate per IVEP batch were negative (R = -0.02 and R = -0.05, respectively; P > 0.05). The retrospective analysis in Holstein breed showed that the IVEP batches with results of 0 to 20% and 80 to 100% were associated with aspiration sessions that produced the same number of total and viable COC (10.3 $\pm$ 0.8 and 5.2 $\pm$ 0.5 vs. 12.0 $\pm$ 1.4 and 5.6 $\pm$ 0.7, respectively; P < 0.0001). Coherently, the hypothetical selection of Holstein donors ranked in the first and second quartiles of total oocyte production would still result in a total number of embryos produced and embryo production rate lower than in Gir donors (4.0 $\pm$ 0.3 and 41.0% vs. 6.5 $\pm$ 0.3 and 55.1%, respectively; P < 0.001). These results demonstrate that the selection of donors based on COCs production is not the best strategy to optimize IVEP results in Holstein, and highlight the need to investigate other potential predictive parameters for the system efficiency.