after each TAI. Cows designated pregnant on Day 21 but NP on Day 33 were termed "false-positive" (FP). On Day 33, all Control females designated NP and FP on RB21 were resynchronised with P4+E2 synchronisation for the second TAI at Day 42. Data were analysed with SAS software (SAS Institute Inc.) and shown in Table 1. For all cows, there were no differences in the three groups (Control, RB21, RB21+EC) for pregnancy/AI (P/AI). In nulliparous heifers, cumulative pregnancies were greater for both RB21 groups compared to Controls at Day 21 or Day 42 of breeding season, with an average day to become pregnant being earlier for RB21. Primiparous and multiparous cows had greater cumulative pregnancies at Day 21 but not Day 42. Primiparous cows at second TAI had lower P/AI in RB21 (34.2%) vs. Control (51.7%); however, RB21+EC (55.8%) was similar to Control. No other parities had differences between RB21 and RB21+EC. Thus, the ReBreed21 program increases the reproductive efficiency in nulliparous and primiparous but not multiparous *Bos indicus* cattle. Adding EC to RB21 program only improves P/AI in primiparous cows.

Table 1. Reproductive outcomes for the treatment groups (Control; RB21, and RB21+EC) for pregnancy per AI (P/AI) and for cumulative pregnancies by parity[1]

Variable	Control	ReBreed21	ReBreed21 + EC	FP	*P*-value
For each TAI					
First	57.5% (419/728)	55.2 (379/687)	55.5 (372/670)		0.61
Second	44.0% (136/309)	37.2 (103/277)	43.5 (111/255)	33.8 (25/74)	0.17
Third		29.0 (42//145)	32.5% (40/123)		0.6
Cumulative pregnancies					
Nulliparous					
Day 21	43.6%[b] (123/283)	62.3%[a] (175/281)	63.6%[a] (178/280)		<0.01
Day 42	63.2%[b] (179/283)	73.3%[a] (206/281)	74.3%[a] (208/280)		<0.01
Time to pregnancy	24	20	20		<0.01
Primiparous					
Day 21	60.4%[b] (145/240)	72.9%[a] (148/203)	79.5%[a] (155/195)		<0.01
Day 42	82.5% (198/240)	79.8 (162/203)	85.1 (166/195)		0.38
Time to pregnancy	17	14	12		0.13
Multiparous					
Day 21	66.3%[b] (136/205)	76.8%[a] (156/203)	75.4%[a] (147/195)		0.04
Day 42	86.8% (178/205)	81.8 (166/203)	84.1 (164/195)		0.38
Time to pregnancy	14	12	13		0.97

[a,b]Lowercase letters indicate differences ($P \leq 0.05$).
[1]Average day to become pregnant (time to pregnancy); FP were cows that were designated pregnant on Day 21 (RB21 groups) but nonpregnant on Day 33. These were synchronised with the Control group to receive second TAI on Day 42 of the breeding season.

Oocyte Collection

127 Does selection for oocyte yield indirectly affect production traits in Gir cattle (*Bos taurus indicus*)?

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In vitro embryo production (IVEP) has been broadly used in animal breeding programs worldwide, resulting in an increasing contribution of selected donors to the cattle population's genetic status. However, the association between donor potential for IVEP and other important production traits is still not fully understood. The aim of the present study was to evaluate whether selection of donors, based on oocyte yield, could potentially impact the genetic progress of other production traits. To address that, we evaluated a database containing records of OPU-IVEP sessions performed on 658 Gir (*Bos taurus indicus*) donors from a dairy farm located at the state of Minas Gerais, Brazil. We considered only data from the very first OPU of each cow to avoid any bias due to the expected reduction in oocyte recovery observed when donors are repeatedly subjected to OPU. We analysed the numbers of total, viable, grade I oocytes, and the percentage of viable oocytes, as well as the number of embryos produced and blastocyst rates. Then, the genomic predicted transmitting ability for milk (GPTAm) and for age at first calving (GPTAafc) were determined for each donor using the GeneSeek Genomic Profiler (GGP) Bovine 50K

microchip (Neogen Corp.). For data analysis, donors were first ranked into quartiles according to total oocyte yield, where the first quartile represents donors with the lowest oocyte numbers. All other endpoints were then compared among quartiles by ANOVA using the PROC GLM of SAS (SAS Institute Inc.). The associations between oocyte/embryo yield and GPTAm or GPTAafc were determined using the Pearson correlation method. Results are shown as mean ± s.e.m. or R (correlation coefficient) values. The average GPTAm was 235.2 ± 8.1 (ranging from −385 to 815) and GPTAafc was −5.7 ± 0.7 (ranging from −47 to 68). As expected, OPU-IVEP outcomes differed among quartiles (total oocytes: 11.4 ± 0.3^{a}, 22.4 ± 0.2^{b}, 33.2 ± 0.3^{c}, and 54.8 ± 1.2^{d}; viable oocytes: 8.2 ± 0.3^{a}, 17.3 ± 0.3^{b}, 26.0 ± 0.4^{c}, and 44.1 ± 1.2^{d}; and embryos produced: 1.6 ± 0.1^{a}, 2.0 ± 0.2^{a}, 3.3 ± 0.3^{b}, and 4.7 ± 0.5^{c} for quartiles I, II, III, and IV, respectively; $P < 0.0001$). Cows within the last quartile produced 2.9-fold more embryos (37.2% of total) than those within the first quartile. Nevertheless, there was no difference in GPTAm ($P = 0.2721$) or GPTAafc ($P = 0.2178$) among quartiles. There was also no correlation between GPTAafc and total oocytes ($R = 0.05$, $P = 0.17$); viable oocytes ($R = 0.01$, $P = 0.87$); embryos produced ($R = -0.01$, $P = 0.91$); or embryo rate ($R = 0.03$, $P = 0.43$). In contrast, a low but significant correlation between GPTAm and the number of total and viable oocytes recovered ($R = 0.09$, $P = 0.02$, and $R = 0.12$, $P = 0.002$, respectively) was observed, even though GPTAm did not affect embryo production nor blastocyst rate ($R = 0.07$, $P = 0.08$, and $R = -0.06$, $P = 0.13$, respectively). In summary, our results suggest that intensive use of IVEP in Gir donors may result in a low but positive selection for GPTAm over time.

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128 Features and developmental potential of oocytes collected from Nelore (*Bos taurus indicus*) calves at the early and late prepubertal phase

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The use of calves as oocyte donors for *in vitro* embryo production (IVEP) is a strategy to shorten generation interval and to accelerate herds' genetic gains. However, oocytes recovered from calves are less competent and generate fewer embryos than those obtained from adult cattle. This study evaluated the features and developmental capacity of oocytes obtained from Nelore calves at 2 to 5 and 8 to 11 months of age. Eight calves underwent oocyte retrieval every other 15 days, from 2 to 5 months of age by laparoscopic ovum pick-up (OPU) and from 8 to 11 months old by transvaginal OPU. Adult, multiparous cows were used as controls. The cumulus-oocyte complexes (COC) were used for IVEP. A subset of the oocytes was evaluated for morphology, diameter, and expression of genes related to oocyte transcriptional activity (*HAT1*, *CREBBP*, *NCOA2*, *HDAC1*, *HDAC2*, and *HDAC3*). Data were analysed by ANOVA or Kruskal–Wallis test, depending on normality ($P < 0.05$). Adult cattle produced more ($P < 0.05$) grade I (12.9% vs. 4.1% and 1.7%) and fewer grade III COC (30.1% vs. 44.5% and 49.0%, respectively) than 8- to 11-month and 2- to 5-month-old calves. Oocyte diameter in older calves was similar to that in cows but greater than that in younger calves (124.8 ± 8.5 μm and 126.0 ± 7.5 μm vs.121.3 ± 7.5 μm, respectively; $P < 0.05$). The expression of *HDAC3* was up-regulated ($P < 0.05$) in cows compared to calves, and no difference was found for other genes. Blastocyst rates were similar between 8- to 11-month-old calves and adult controls (42.0% vs. 48.1%, respectively; $P > 0.05$), but lower in 2- to 5-month-old calves compared to their contemporaneous controls (31.0% vs. 71.6%, respectively; $P < 0.05$). When blastocyst rates were transformed to the proportion of the respective controls, they were lower in younger than in older calves (43.7% vs. 78.7%, respectively; $P < 0.05$). In summary, there is a progressive acquisition of oocyte developmental competence during the prepubertal period, and IVEP results in 8- to 11-month-old Nelore calves are similar to those of cows. These results should be considered when deciding whether is worth recovering oocytes from early prepubertal calves.

129 Effect of equine chorionic gonadotrophin doses on number and size of ovarian follicles at the time of oocyte collection in llamas

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In vitro embryo production (IVP) has been attempted in South American camelids mainly using oocyte recovered from abattoir ovaries. Few experiences of oocyte collection from superstimulated live animals have been reported. Early experiences of ovarian superstimulation in llamas and alpacas have shown that eCG induces multiple follicular development but with variable results. Thus, developing a well-established protocol of ovarian superstimulation is necessary in this species. The aim of this study was to evaluate the effect of three doses of equine chorionic gonadotrophin (eCG) on multiple follicular development and the size of the follicles at the time of oocyte collection. To this