

## Abstracts - 35th Annual Meeting of the Brazilian Embryo Technology Society (SBTE) Male reproductive physiology and sperm technology

## Sperm head morphometry may be related to reduced semen fertility at timed-AI

José Andres Nivia Riveros<sup>1</sup>, Ana Carolina Bahia Teixeira<sup>1</sup>, Isabelle Cristina Pereira<sup>1</sup>, Juliana Horta Wilke Diniz<sup>1</sup>, Lays Oliveira Rocha<sup>2</sup>, Marcelo Emílio Beletti<sup>2</sup>, Alan Maia Borges<sup>1</sup>, Leticia Zoccolaro Oliveira<sup>1</sup>

<sup>1</sup> UFMG - UNIVERSIDADE FEDERAL DE MINAS GERAIS (Belo Horizonte, MG, 31270-901, Brazil), <sup>2</sup> UFU - UNIVERSIDADE FEDERAL DE UBERLÂNDIA (Uberlândia, MG 38400-902, Brazil)

## Resumo

The aim of this study was to evaluate conventional in vitro sperm characteristics, morphometry and DNA integrity and to compare them with in vivo fertility. Six semen batches (from six different Angus bulls; a single batch of each bull) were utilized for Timed-AI of 890 lactating Nelore cows (30-40 DPP) at the same farm. All batches were equally divided into seven breeding groups (approximately 125 cows per breeding group) and three AI technicians. In the lab, the same semen batches used in the field were evaluated, being performed three replicates per batch (i.e., 3 repetitions from the same batch). Semen (500µL) was thawed (37°C/30s) and the following parameters were assessed: motility, vigor, concentration, morphology, computer assisted semen analysis and analysis of chromatin integrity and sperm morphometry by toluidine blue. Field data were analyzed by stepwise logistic regression (mixed generalized linear model with binomial distribution) and laboratory results by Tukey test or Kruskal-Wallis test (according to statistical premises). For all analyses, it was considered 5% of significance (R software). Overall conception rate (CR) was 49%. The semen batch was an important factor affecting CR (P=0.007). No effect of BCS (P=0.459), AI technician (P=0.562) or breeding group (P=0.398) were detected, nor their interactions (P>0.05). For each batch (B), the following CR were observed (B1: 42.6%a, n=162; B2: 40.3%a, n=119; B3: 52.3%ab, n=174; B4: 44.6%ab, n=139; B5: 53.0%ab, n=168; B6: 60.9%b, n=128). Considering the semen batches that presented different in vivo fertility (single batches from bulls 1, 2 and 6), no differences were observed in the in vitro sperm analyzes performed, except for some sperm head morphometric traits. B1 presented higher (P=0.0001) shape factor (SF; T1: 0.910±0.001a; T2: 0.896±0.005b; T6: 0.889±0.003bc), smaller (P=0.0025) anteroposterior symmetry (APS; T1:0.880±0.002b; T2:0.908±0.010a; T6:0.908±0.004a) and higher (P=0.0141) Fourier 1 (T1:144.02±6.539a; T2:112.78±17.813ab; T6:110.39±9.206b) than B6. Thus, B1 presented sperm morphometric traits that can be considered inferior to B6. Higher values of SF are associated with sperm immaturity and reduced APS with higher percentages of asymmetric sperm in the sample (cells with a narrower posterior portion of sperm head). Higher values of Fourier 1 are associated with rounder shapes of the anterior portion of sperm head, corroborating with SF and APS findings. Although further studies are needed to elucidate the real implication of these sperm traits on field fertility, one cannot fail to consider that the sperm morphometric differences observed may be related to the reduced fertilizing capacity of B1, thus justifying, at least in part, the lower field fertility of this semen. Still, among the in vitro sperm traits assessed in the present experiment, only SF, APS and Fourier 1 seemed to be related to the in vivo fertility results of the batches evaluated.

## Acknowledgements

FAPEMIG.