XXIV Congresso Brasileiro de Reprodução Animal
VIII International Symposium on Animal Biology of Reproduction - Joint Meeting
CBRA

LARAA
laboratório de andrologia e reprodução assistida animal

Universidade Estadual de Londrina

Influence of sperm subpopulations of Angus and Nellore bulls on pregnancy rates by FTAI

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INTRODUCTION

The heterogeneity of ejaculate indicates that fertility is still variable among bulls and that more stringent evaluation methods have needed to identify the ejaculates suitable for AI.

The aim of this study was to identify and characterize sperm subpopulations in thawed semen doses of Angus and Nellore bulls to evaluate the influence of these sperm subpopulations on pregnancy rate in cows submitted to FTAI.

MATERIAL AND METHODS

N= 18

Angus N= 9

Nelore N= 9

Evaluations:

37°C/ 30s

1

2

Membrane integrity and spermatic morphology by eosin-nigrosin staining
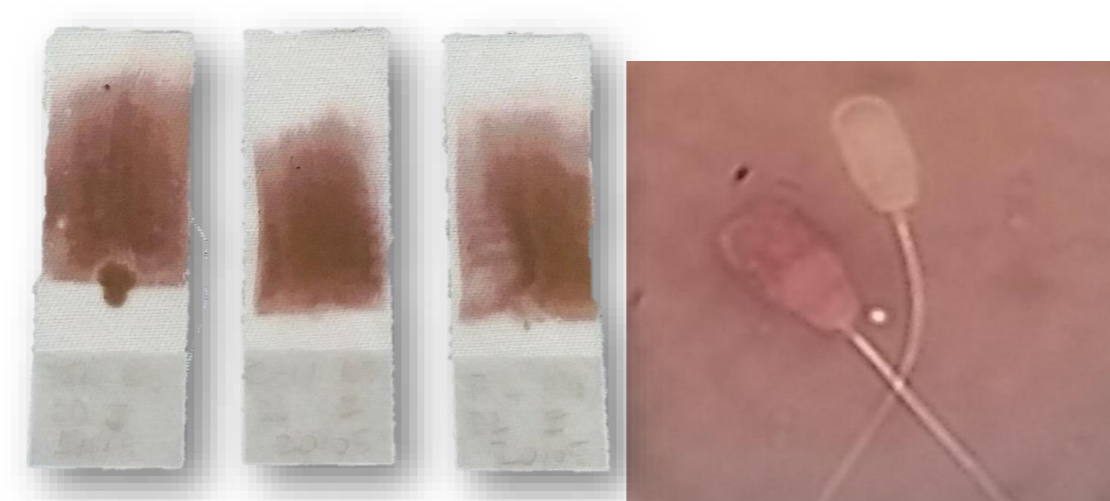
Sperm kinetics and sperm subpopulations evaluated by the CASA System

Sperm subpopulations
Analysis
T-test
Significance level 5%

RESULTS

There was no influence between breeding bulls for sperm characteristic and pregnancy rate. Except in slow and static cells (Table 1).

Table 1- Sperm parameters of post-thawed semen from Angus and Nelore bulls (mean ± SD)

Sperm Parameters	Bulls Group		
	Angus (N=9)	Nelore (N=9)	P value
Morphology (%)	14.55 ± 7.65	19.88 ± 8.44	0.179
Membrane integrity (%)	81.00 ± 4.74	82.22 ± 6.47	0.654
Pregnancy Rate (%)	49.54 ± 8.77	56.64 ± 8.03	0.092
VAP (µm/s)	82.41 ± 14.32	89.30 ± 17.97	0.382
VSL (µm/s)	65.33 ± 9.98	65.62 ± 5.84	0.941
VCL (µm/s)	135.64 ± 30.27	156.30 ± 47.44	0.290
ALH (µm)	5.96 ± 1.43	6.74 ± 1.77	0.323
LIN (%)	52.11 ± 8.52	46.88 ± 11.37	0.287
RAPID (%)	44.22 ± 16.03	57.00 ± 7.88	0.053
MEDIUM (%)	12.55 ± 5.85	12.22 ± 7.18	0.915
SLOW (%)	16.44 ± 5.41	21.66 ± 3.35	0.028
STATIC (%)	27.22 ± 22.68	9.33 ± 7.08	0.048

VAP: average path velocity; VSL: straight line velocity; VCL: curvilinear velocity; ALH: lateral head amplitude; LIN: linearity; RAPID: fast sperm velocity, MEDIUM: medium sperm velocity; SLOW: slow sperm velocity; STATIC: static sperm.

Based on CASA system data and clustering procedures, four sperm subpopulations were statistically established:

SP1: Fast and progressive spermatozoa,

SP2: Slow and progressive spermatozoa,

SP3: Fast and nonlinear spermatozoa and

SP4: Slow and nonlinear spermatozoa.

In Angus bulls, higher percentage of SP3 (33.25%) were found. Whereas, Nelore bulls had greater percentage of SP1 (33.82%).

CONCLUSION

Thus, it is concluded that both breeds of bulls presented similar proportions of sperm subpopulations, therefore pregnancy rate in cows submitted to the IATF programs on a large scale was similar.