

Quality of Stallion Sperm
processed with Androcoll-E™
and their relation with
in vivo fertility

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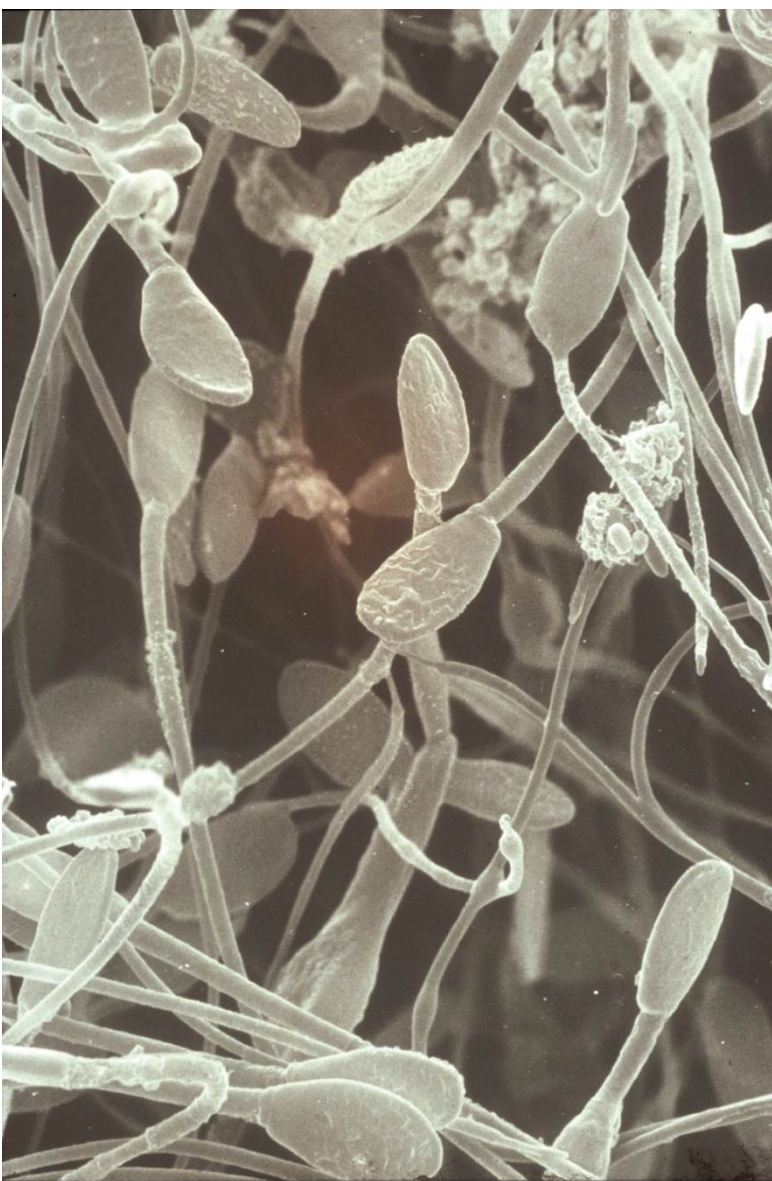
² CERNAS – Natural Resources, Environment and Society Centre, Coimbra, Portugal

³ ICBAS – Instituto de Ciências Biomédicas Abel Salazar, Porto, Portugal

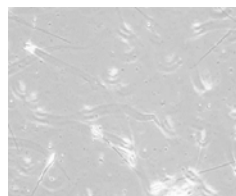
Quality of Stallion Sperm processed with Androcoll-E™ and their relation with *in vivo* fertility



Sperm



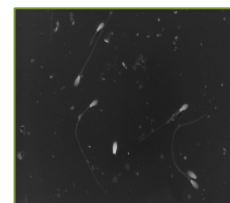
Motility



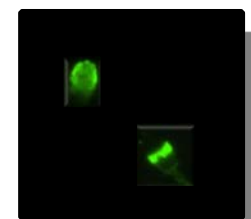
Vitality



Morphology



Acrosome



animal reproduction
SCIENCE

Animal Reproduction Science
Volume 116, Issue 1, Pages 119-128, November 2009

Colloidal centrifugation with Androcoll-E™ prolongs stallion sperm motility, viability and chromatin integrity

A. Johannisson, J.M. Morrell, J. Thorén, M. Jönsson, A.-M. Dalin, H. Rodriguez-Martinez

Vol.2, No.3, 159-165 (2012)
doi:10.4236/ojas.2012.23022

Open Journal of Animal Sciences

Single Layer Centrifugation with Androcoll-E™ improved progressive motility and percentage of live spermatozoa with intact acrosome of chilled stallion semen but did not have an effect on DNA integrity*

Ana Luisa Costa¹, Ana Martins-Bessa¹, Ana Rebello de Andrade², Tiago Guimarães³, Maria Rosa Rebordão⁴, Sandra Gamboa⁴, Pedro Pinto Bravo⁴, Maria José Correia⁵, Jorge Colaço¹, Isabel Gaivão¹, António Rocha³

Reproductive BioMedicine Online

Reproductive BioMedicine Online
Volume 21, Issue 3, Pages 429-436, September 2010

Single layer centrifugation of stallion spermatozoa improves sperm quality compared with sperm washing

J.M. Morrell, H. Rodriguez-Martinez, A. Johannisson


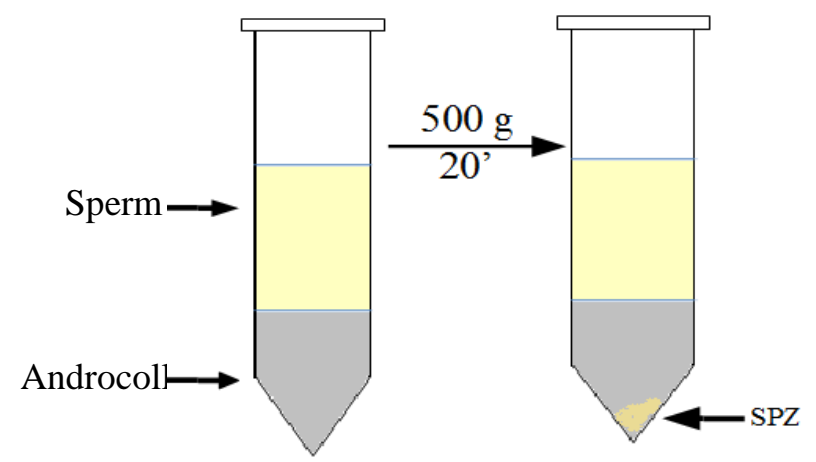
Single layer centrifugation of stallion spermatozoa consistently selects the most robust spermatozoa from the rest of the ejaculate in a large sample size

J. M. MORRELL, H. RODRIGUEZ-MARTINEZ, A. JOHANNISSON

Article first published online: 5 JUL 2010
DOI: 10.1111/j.2042-3306.2010.00101.x
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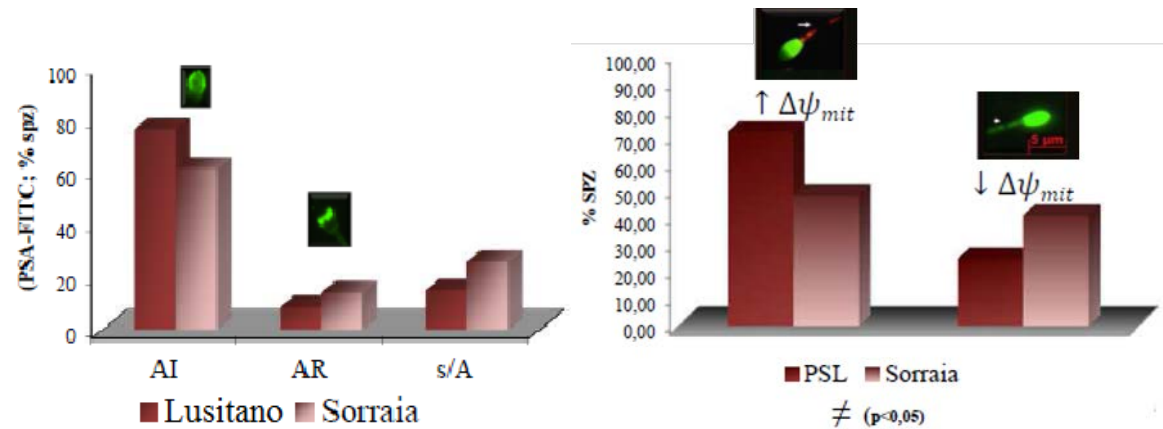
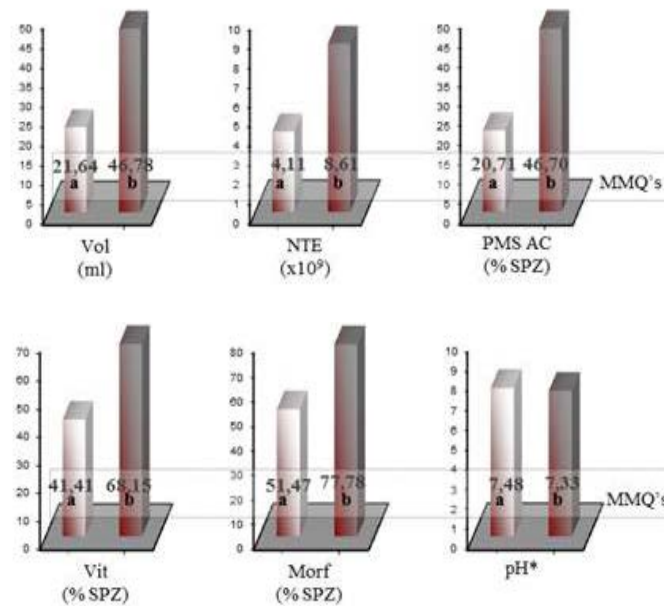
Issue

Equine Veterinary Journal
Volume 42, Issue 7, pages 579-585, October 2010

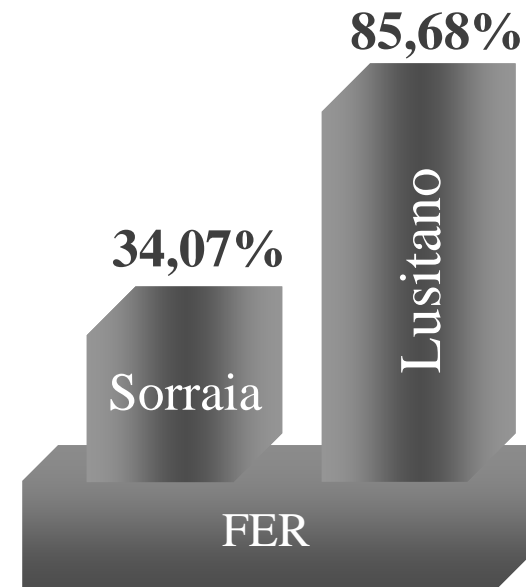
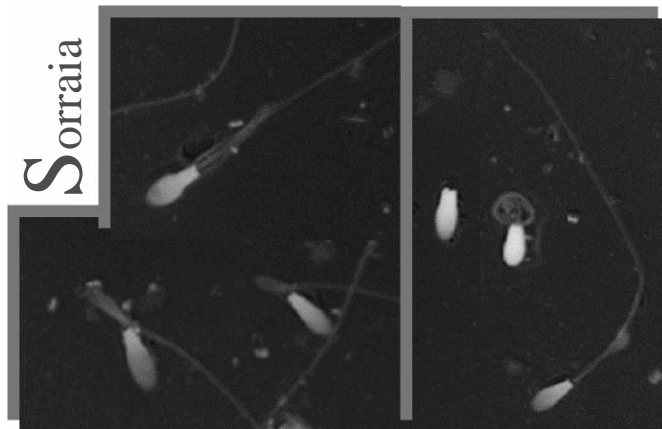
Lusitano vs Sorraia

background



Sorraia Lusitano

Sorraia



SLC with Androcoll™

Lusitano



Sorraia



SLC with Androcoll™

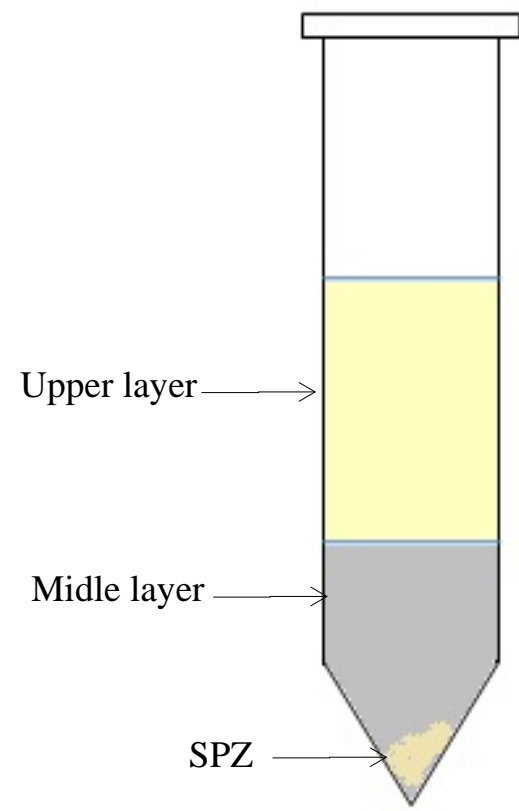
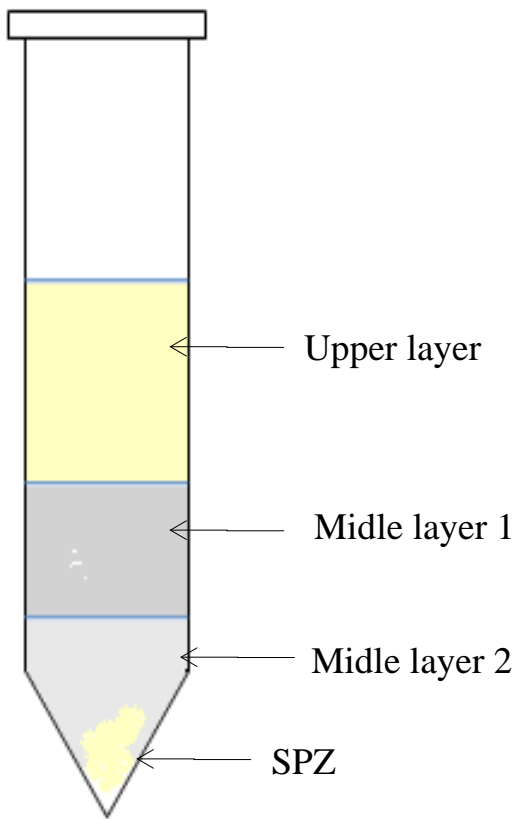
Lusitano



two
consecutive
seasons

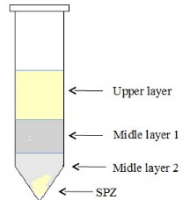


Sorraia



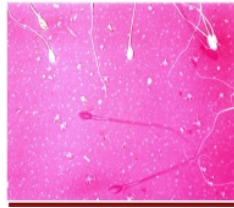
1 Motility

SLC-treatment



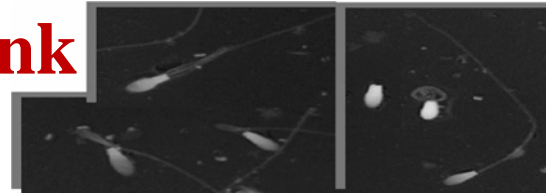
2 Viability

E-N



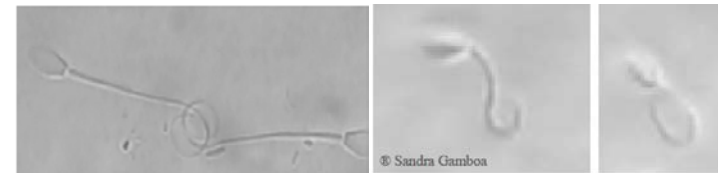
3 Morphology

India ink



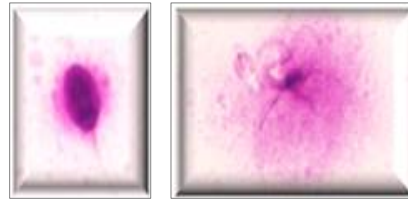
4 Plasmalema functionality

HOS test

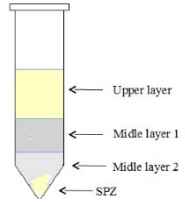


6 DNA integrity

SCD

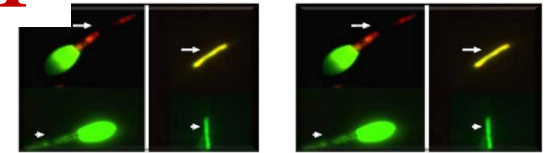


SLC-treatment



5 Mitochondrial functionality ($\Delta\psi_m$)

JC-1



7 Sperm motility: 72h of conservation at 4°C

8 Pregnancy rates

AI

300 × 10⁶ sperm in INRA96



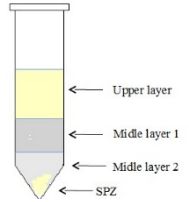
11 mares



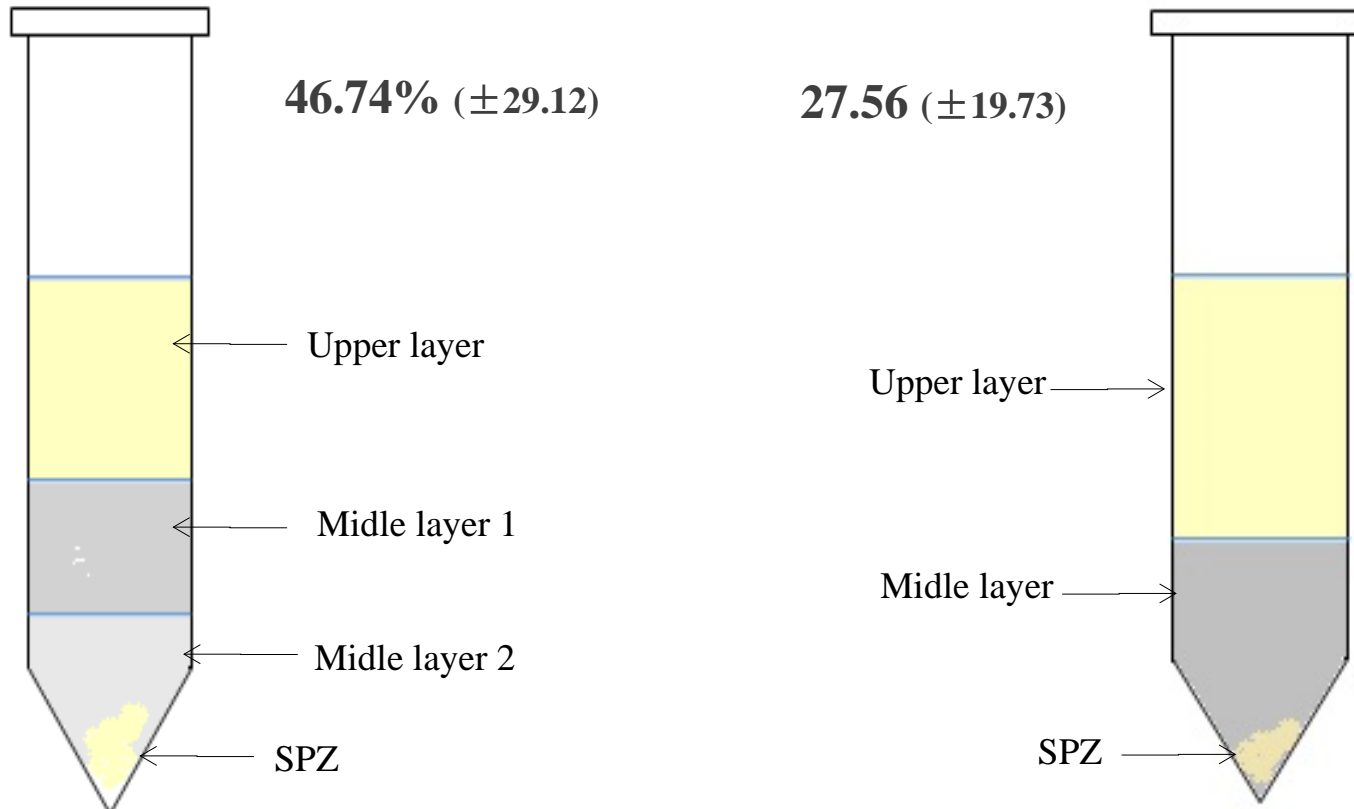
12 mares

SLC with Androcoll™

SLC-treatment

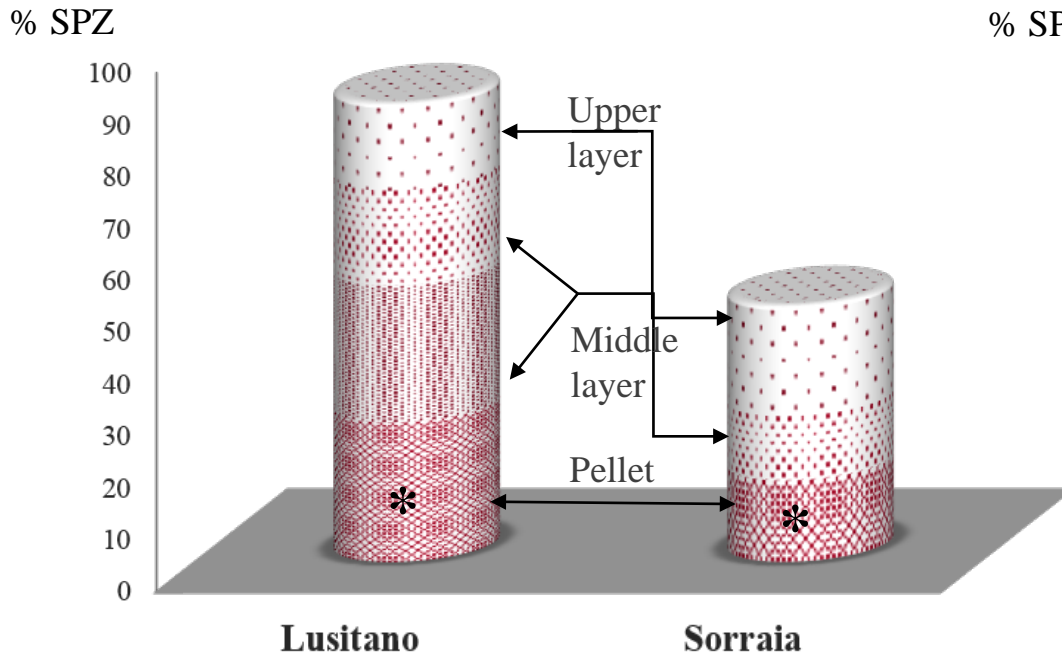


Sperm lost



SLC with Androcoll™

Viability



*- differences between stallions

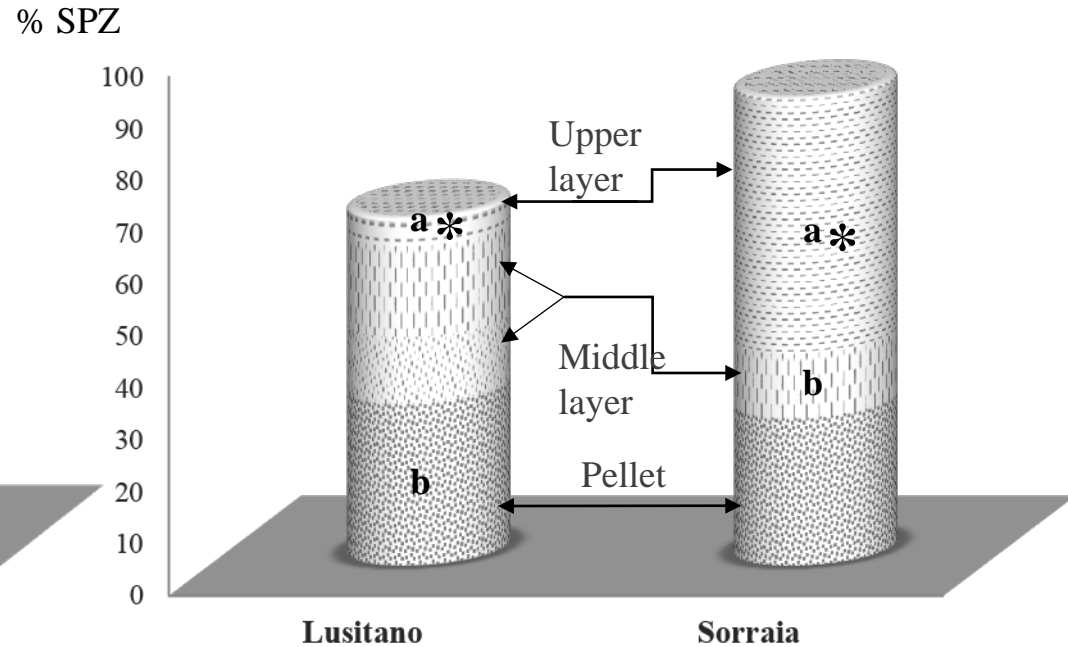
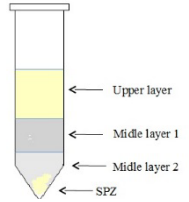
Lusitano \neq Sorraia

Raw semen
($p < 0,001$)

Pellet
($p < 0,01$)

SLC-treatment

HOS +



a, b - differences between layers
*- differences between stallions

Lusitano \neq Sorraia

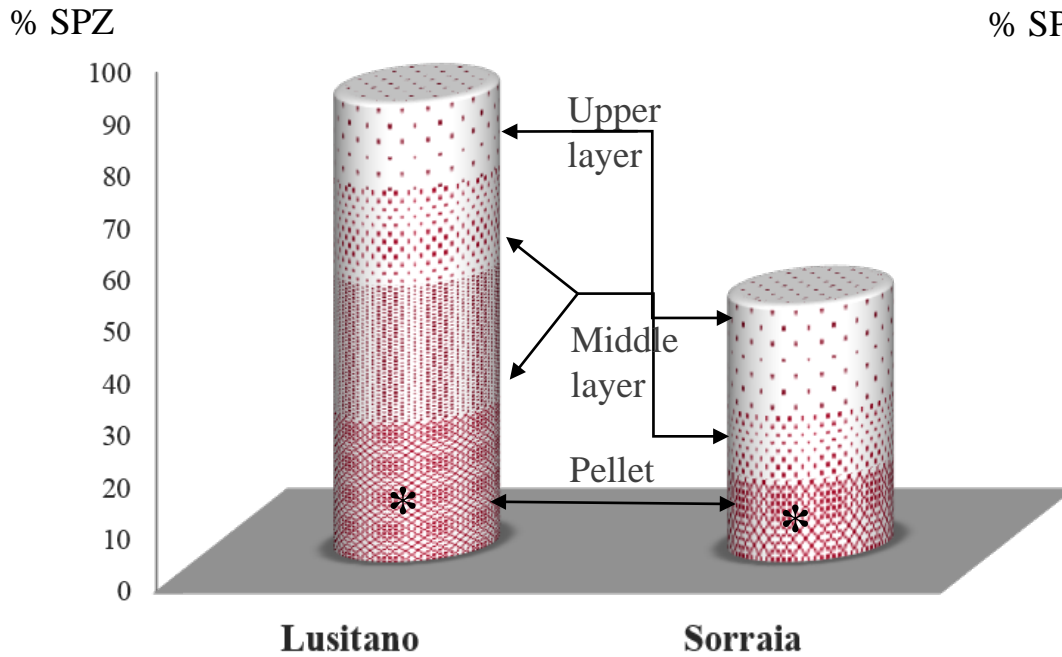
Raw semen
($p < 0,05$)

Upper layer
($p < 0,01$)



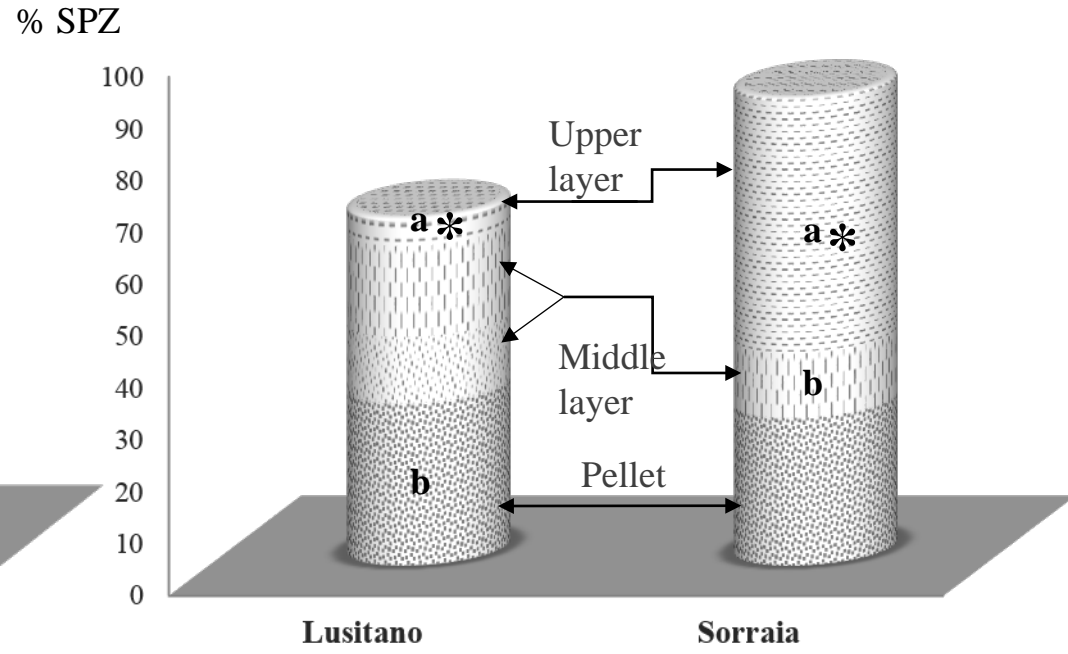
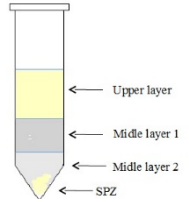
SLC with Androcoll™

Viability



SLC-treatment

HOS +

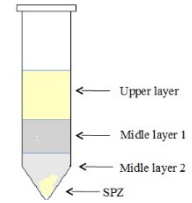


↑ % live and HOS + SPZ

pellet
Lusitano
upper layer
Sorraia

SLC with Androcoll™

SLC-treatment

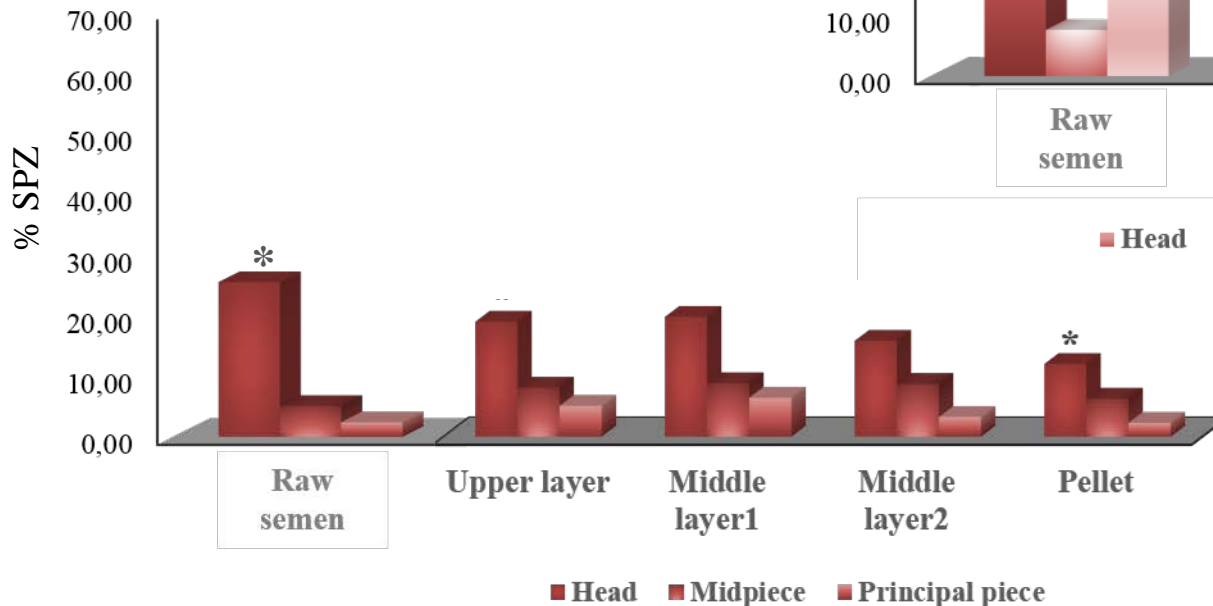


Sperm morphology

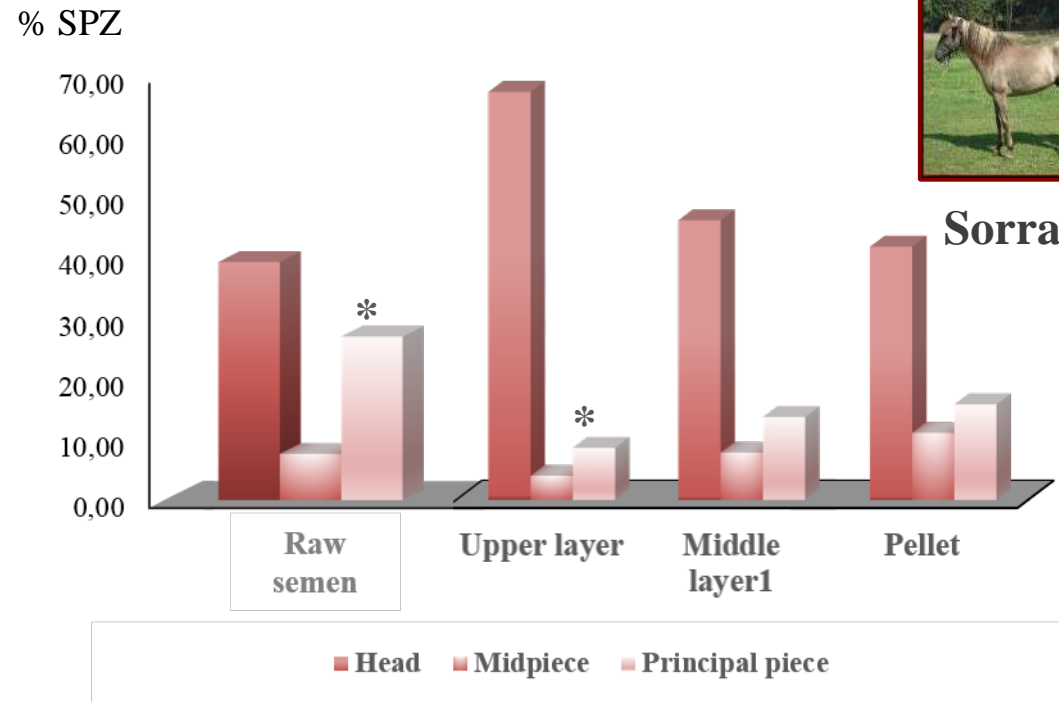


Lusitano (p<0.05)

SLC -better head shape morphology

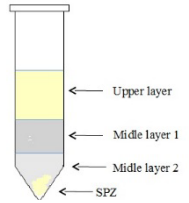


Sorraia (ns)

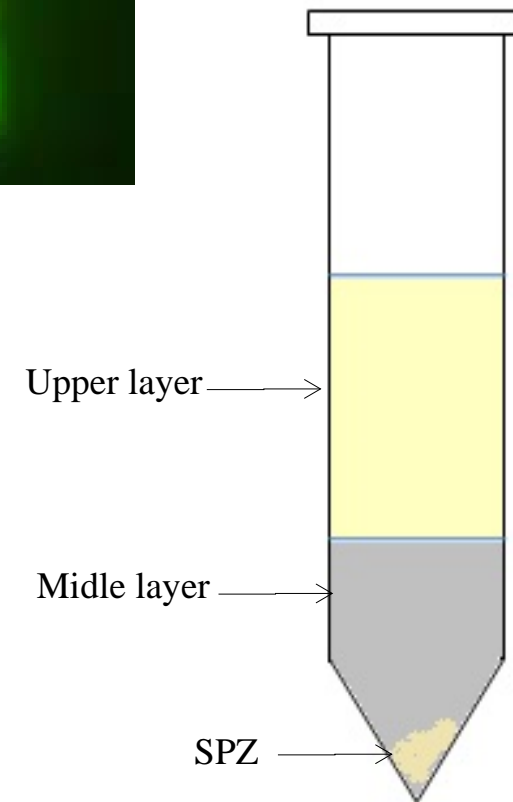
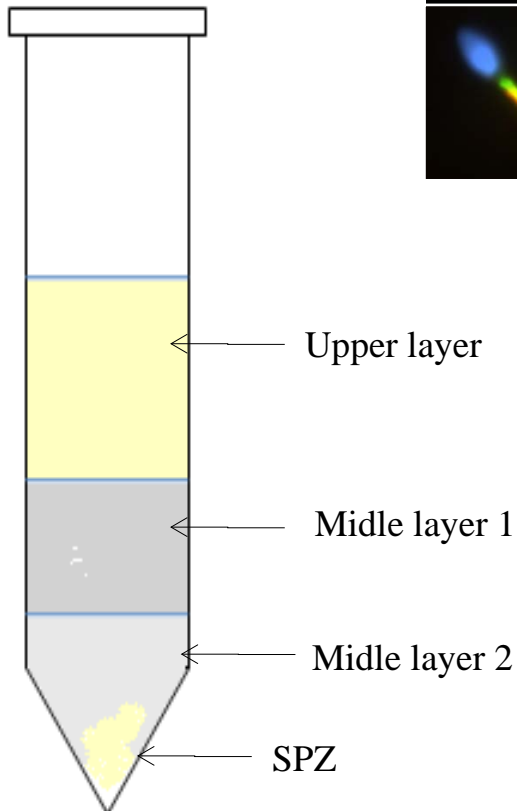
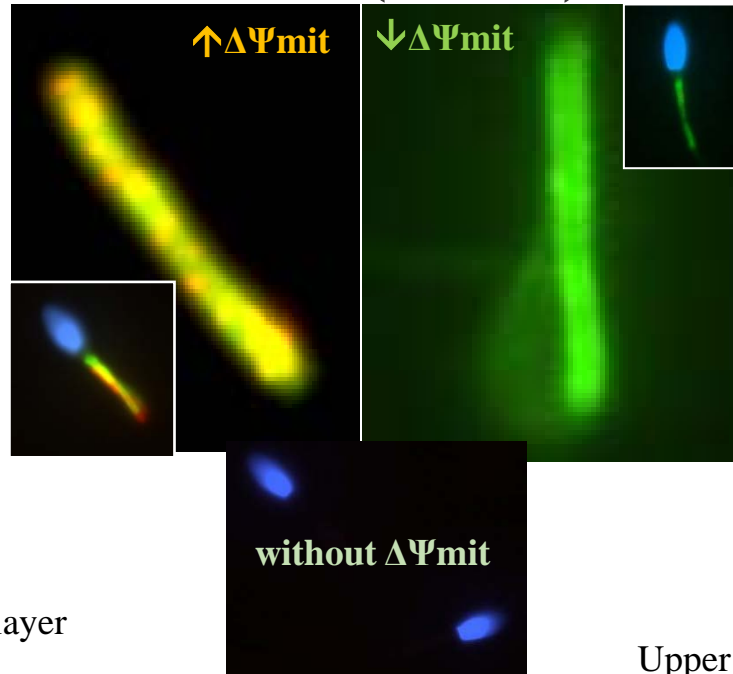


SLC with Androcoll™

SLC-treatment

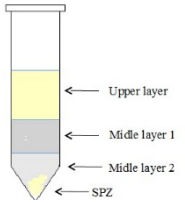


MMP (JC-1)

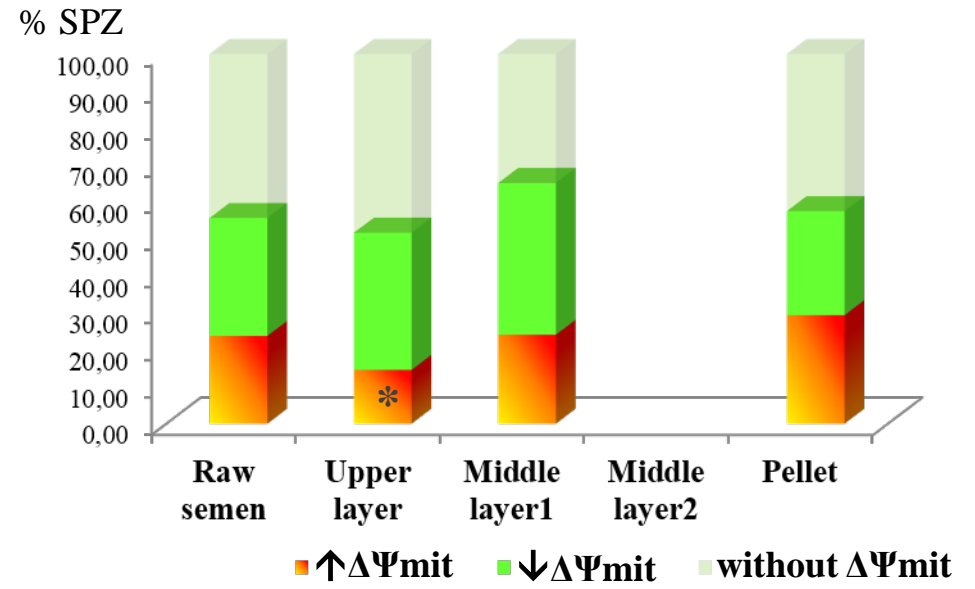
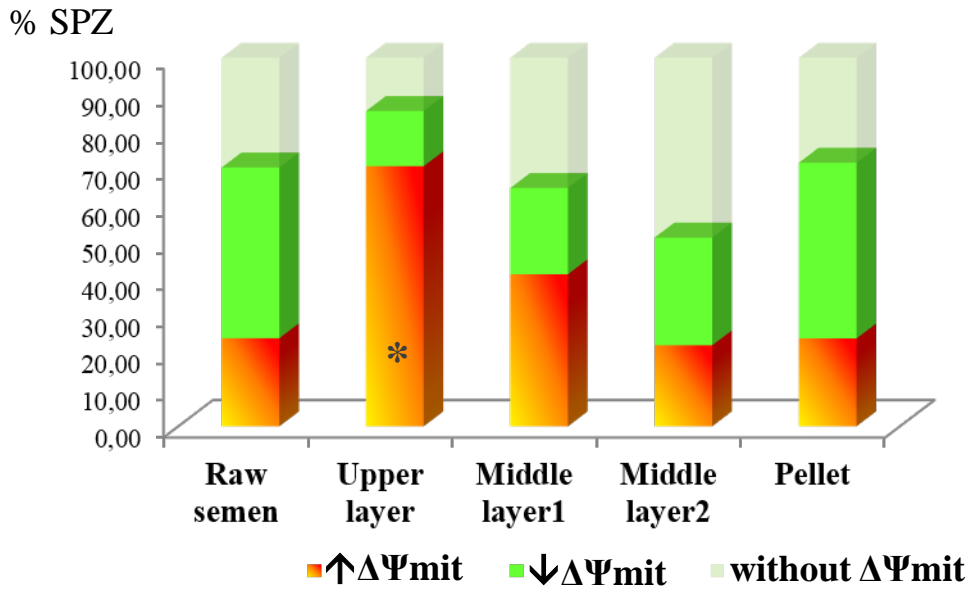


SLC with Androcoll™

SLC-treatment



MMP (JC-1)

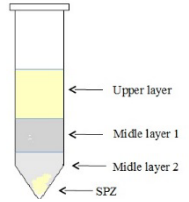


Lusitano ≠ Sorraia

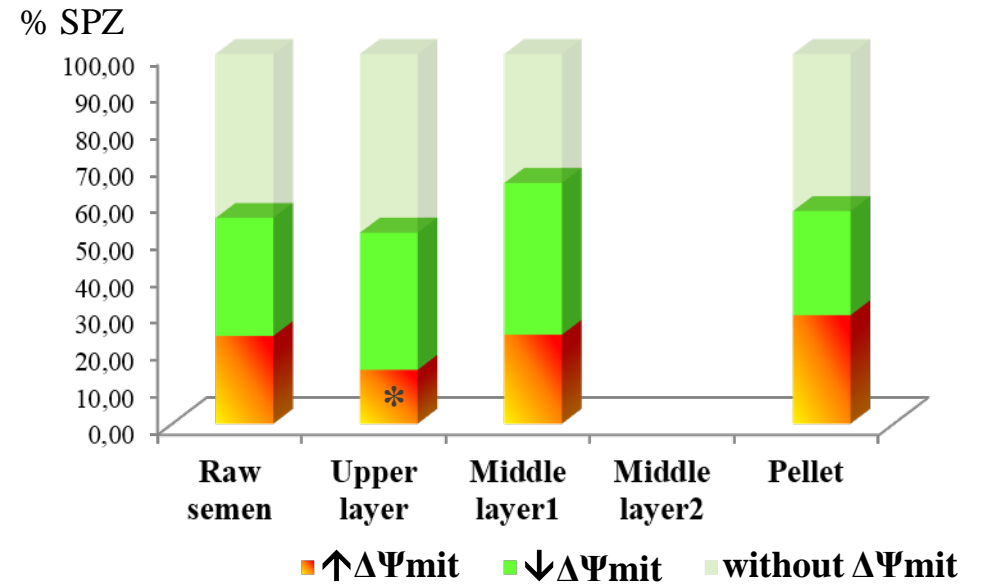
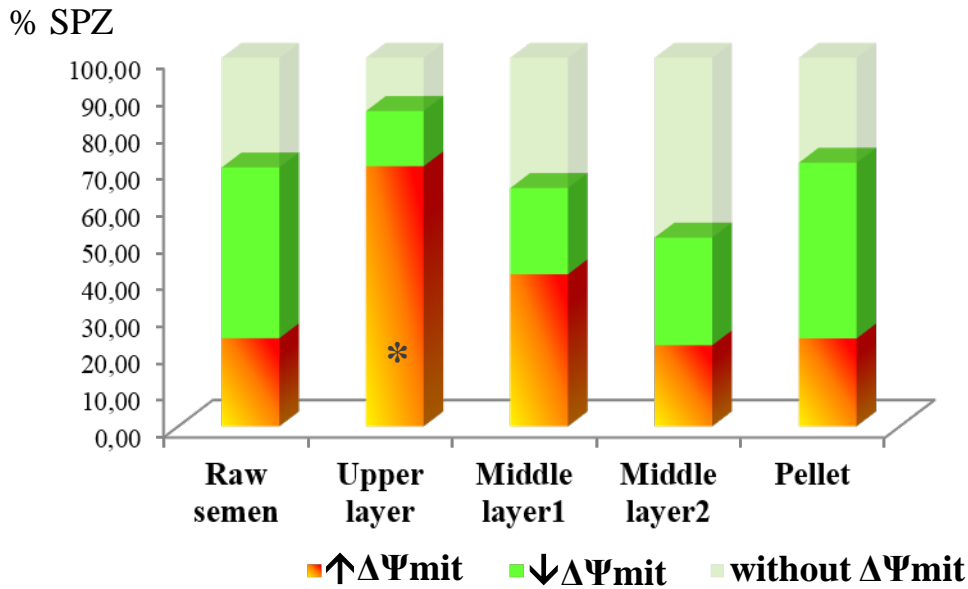
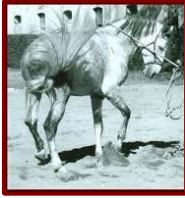
Upper layer
(p<0,05)

SLC with Androcoll™

SLC-treatment



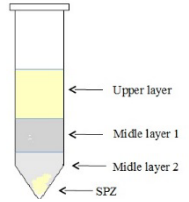
MMP (JC-1)



SLC selected SPZ = Raw semen

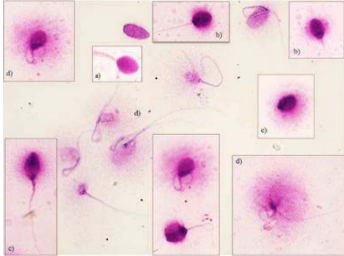
SLC with Androcoll™

SLC-treatment

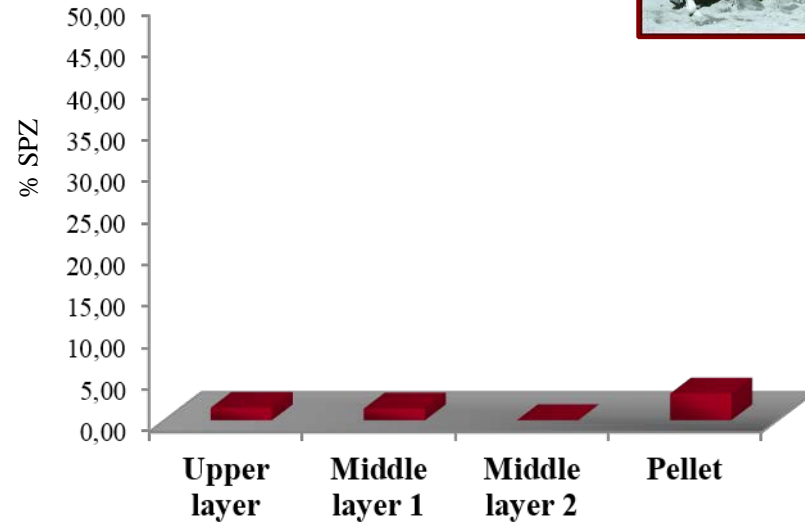
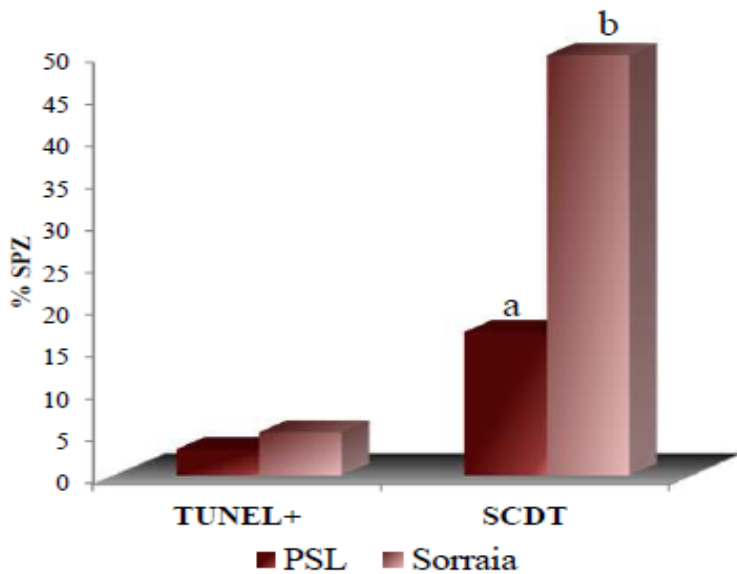
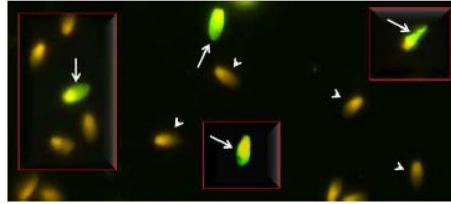


DNA integrity (ns)

SCD test



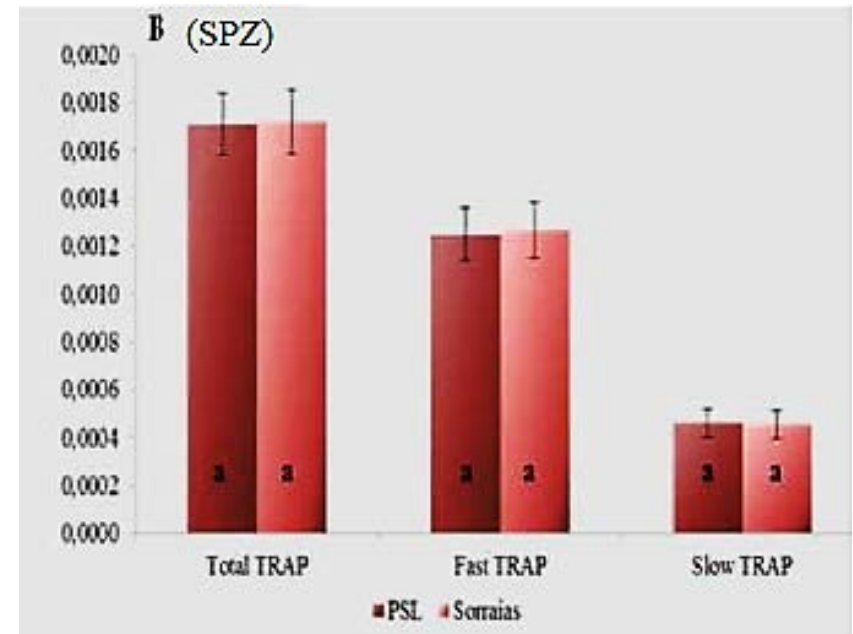
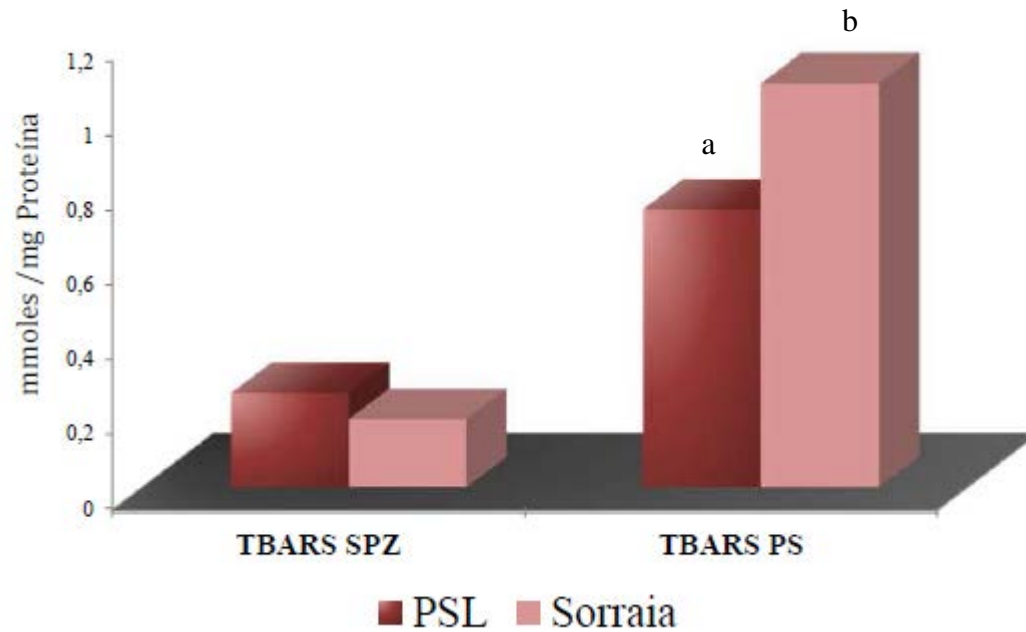
TUNEL



Oxidative stress ?

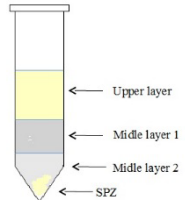
Lusitano vs Sorraia

Lipid - peroxidation



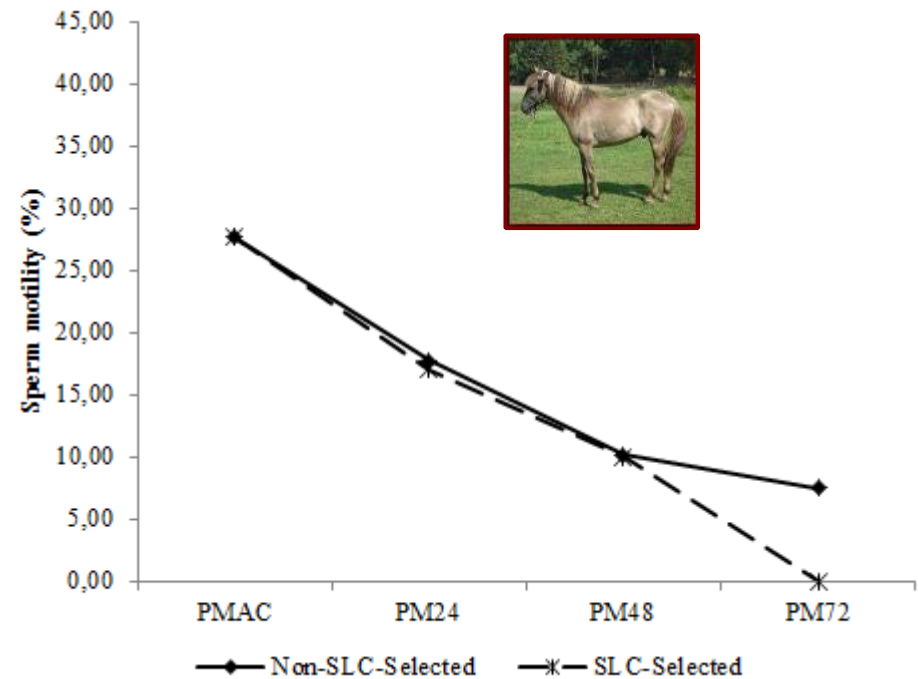
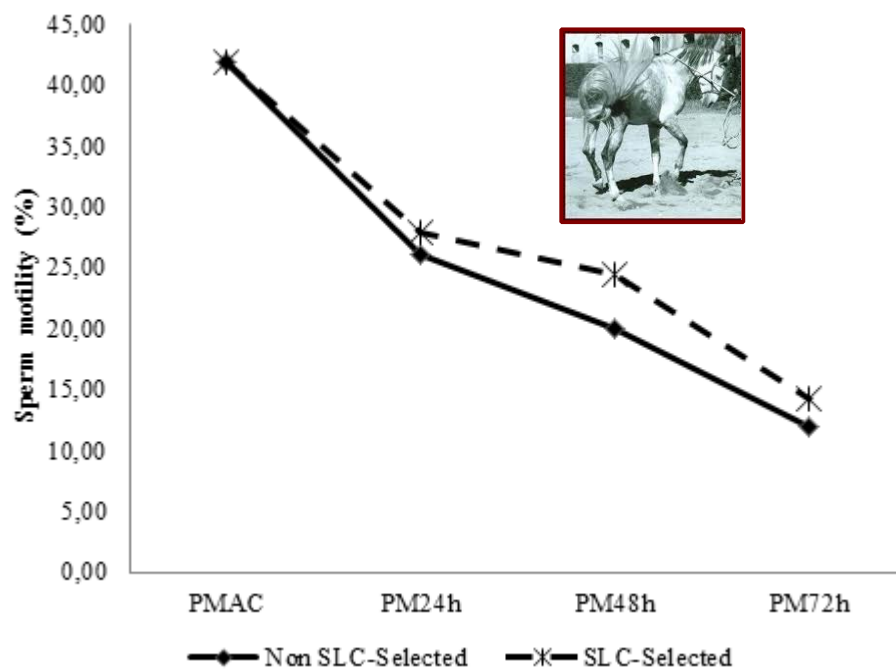
SLC with Androcoll™

SLC-treatment



Sperm Motility

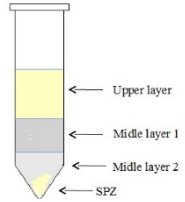
Significant differences between stallions



No differences between treatments

SLC with Androcoll™

SLC-treatment



AI

		DG+	DG-
SLC-treated	Lusitano	7	2
	Sorraia	0	6
non-SLC-treated	Lusitano	8	1
	Sorraia	0	9
Total	Lusitano	15	3
	Sorraia	0	15



Per cycle fertility

78% - SLC-selected sperm
(9 mares; 7 cycles DG+)

0.00% - SLC-selected sperm
(6 mares; 0 cycles DG+)

89% - non-SLC-selected sperm
(9 mares; 8 cycles DG+)

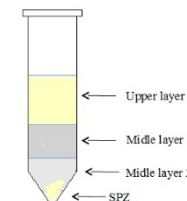
0.00% - non-SLC-selected sperm
(9 mares; 0 cycles DG+)

$$\chi^2(2)=0.400; p=0.527; N=18$$

No differences between treatments

SLC with Androcoll™

SLC-treatment



- Androcoll™ do not selected a high population of viable, morphological normal and osmotically active spermatozoa in Sorraia stallion
- In fertile stallion, the highest percentage of sperm with high mitochondrial potential ($\uparrow\Delta\Psi_{mit}$; JC-1) and DNA integrity (SCD test) was retained in the upper layer.
- Motility in cooled sperm is not significantly improved by SLC
- Fertility is independent of treatment with Androcoll-E™

Acknowledgements

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Miguel Moura
Fábio Alexandre
Manuel Vaz de Castro

Prof. Maria do Mar Oom (FCT, UNL, Portugal)
Technical Secretary of the Sorraia Horse Studbook.

Author Contributions:

S.G. planned the experiment for sperm fractions and AI trial; S.G., A.Q. and F.C. performed the experiments; S.G. and A.Q. analyzed the data; P.B. performed the ultrasonographic examinations of the mares; A.R. is the PI of the project PTDC/CVT/108456/2008)

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Escola Superior Agrária de Coimbra, IPC
CERNAS (PEst-OE/AGR/UI0681/2011)



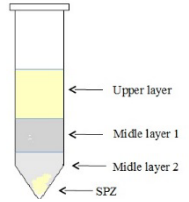


Thank you!

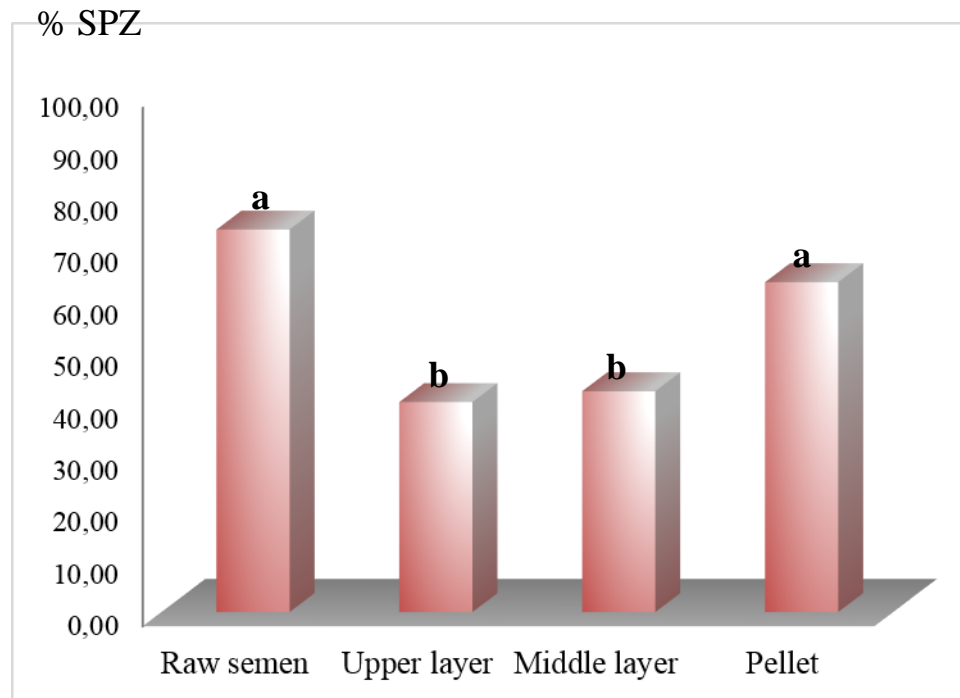
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SLC with Androcoll™

SLC-treatment



Acrosome integrity



a,b – p<0.05 – differences between layers

