LONG-TERM EXPOSURE TO 10% WATER-SOLUBLE LUBRICANTS IS DETRIMENTAL FOR STALLION SPERM MOTILITY

Isabelle BARRIER-BATTUT
& Michèle BOUCABEILLE
French National Studs
La Jumenterie du Pin
61310 Exmes
FRANCE
isabelle.barrier@haras-nationaux.fr

les Haras nationaux

LUBRICATION :

- artificial vagina
- hand of technician before semen deposit in uterus

MINERAL OIL (paraffin or petroleum vaseline) :
Advantage : hydrophobic, does not mix with semen
Disadvantage : difficult to clean, irritating, easily contaminated with bacteria

WATER-SOLUBLE LUBRICANTS :
Advantage : easy to clean
Disadvantage : mix with semen, «non spermicidal» ?? (Limone *et al*, 2002, Samper *et al*, 2007), hyperosmotic (Duoos *et al*, 2002)

AIMS

To test the effect on sperm motility
of long term exposure to 5% or 10% lubricant

- Water soluble lubricants for gynaecological use :
  - gel Virbac® (Virbac, France)
  - Priority Care® (First Priority, USA)
  - Quinogel® (Zootech, France)
  - A.I. gel Equiland (Equiland, France)
  - Bovi-vet gel® (Kruuse, Denmark)

  « non spermicidal »
- Paraffin oil (medicinal white oil, European pharmacopea, Total, France)
- 10% water
- control without lubricant

les Haras nationaux

MATERIAL AND METHODS

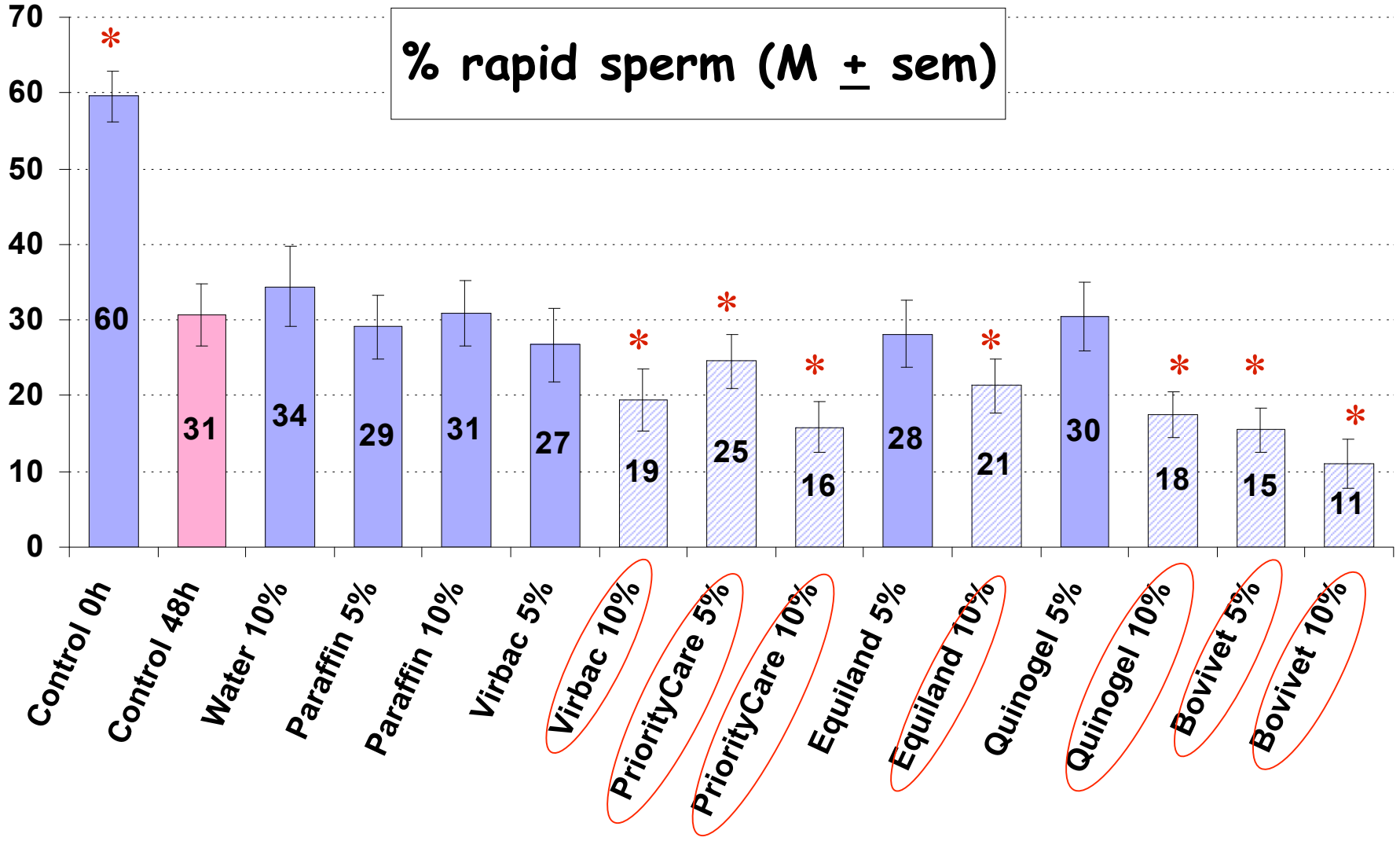
- 16 ejaculates (4 stallions X 4 ejaculates)
- Extender : skim-milk with antibiotics
  control = without lubricant
  mixed (vortex > 10 sec) with 5% or 10% lubricant
- Semen doses : 20.10^6 sperm/mL
- 48h storage at 4°C
- After storage :
  - vortex (10 sec)
  - computer-assisted motility analysis (HTM IVOS analyser) :

% rapid sperm, % progressive sperm, VAP (velocity on average path)

- Statistics : non parametric Wilcoxon test for paired samples
- Measurement of osmolarity in extenders without sperm

les Haras nationaux

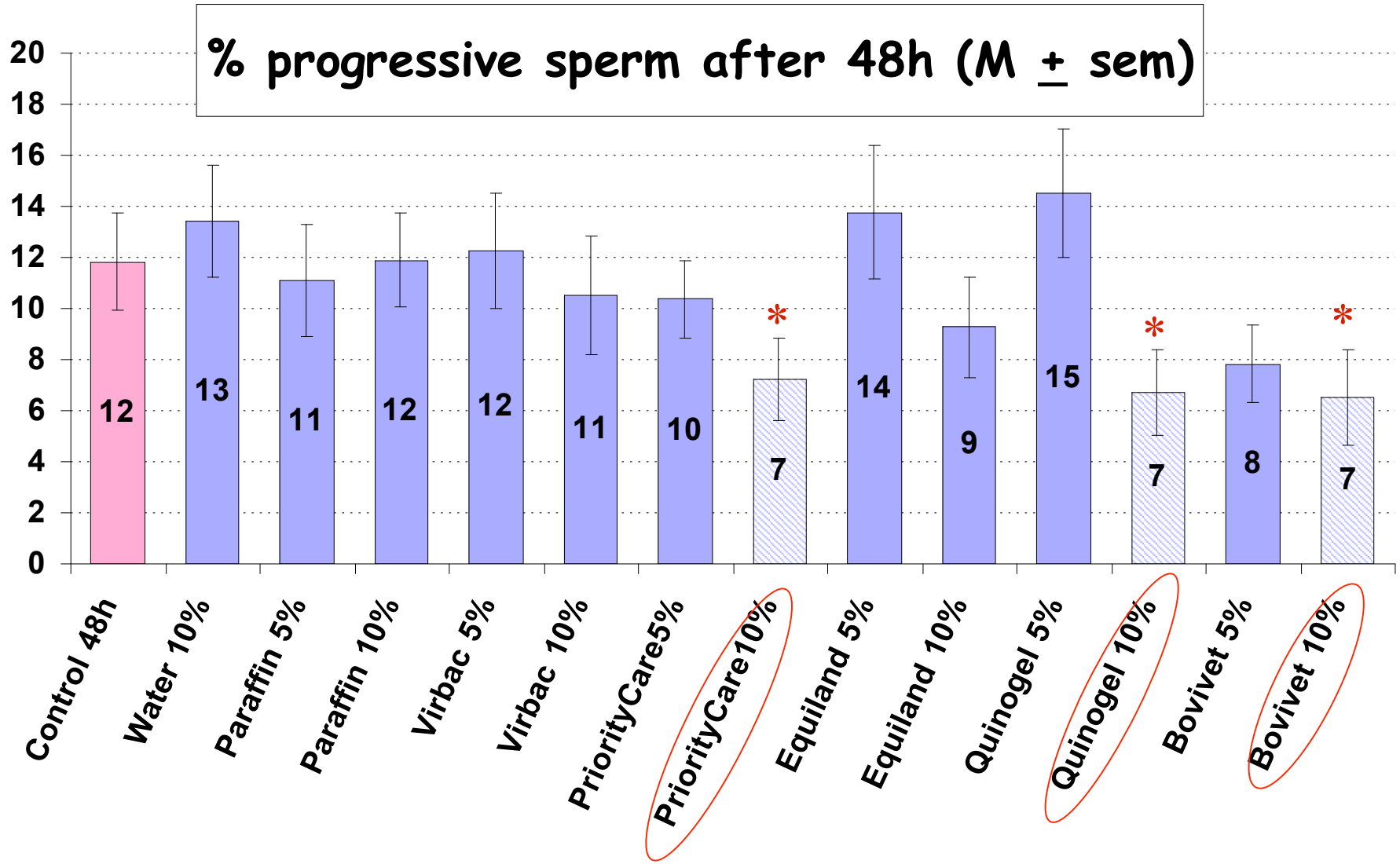
RESULTS



* : significant difference compared to 48h control

les Haras nationaux

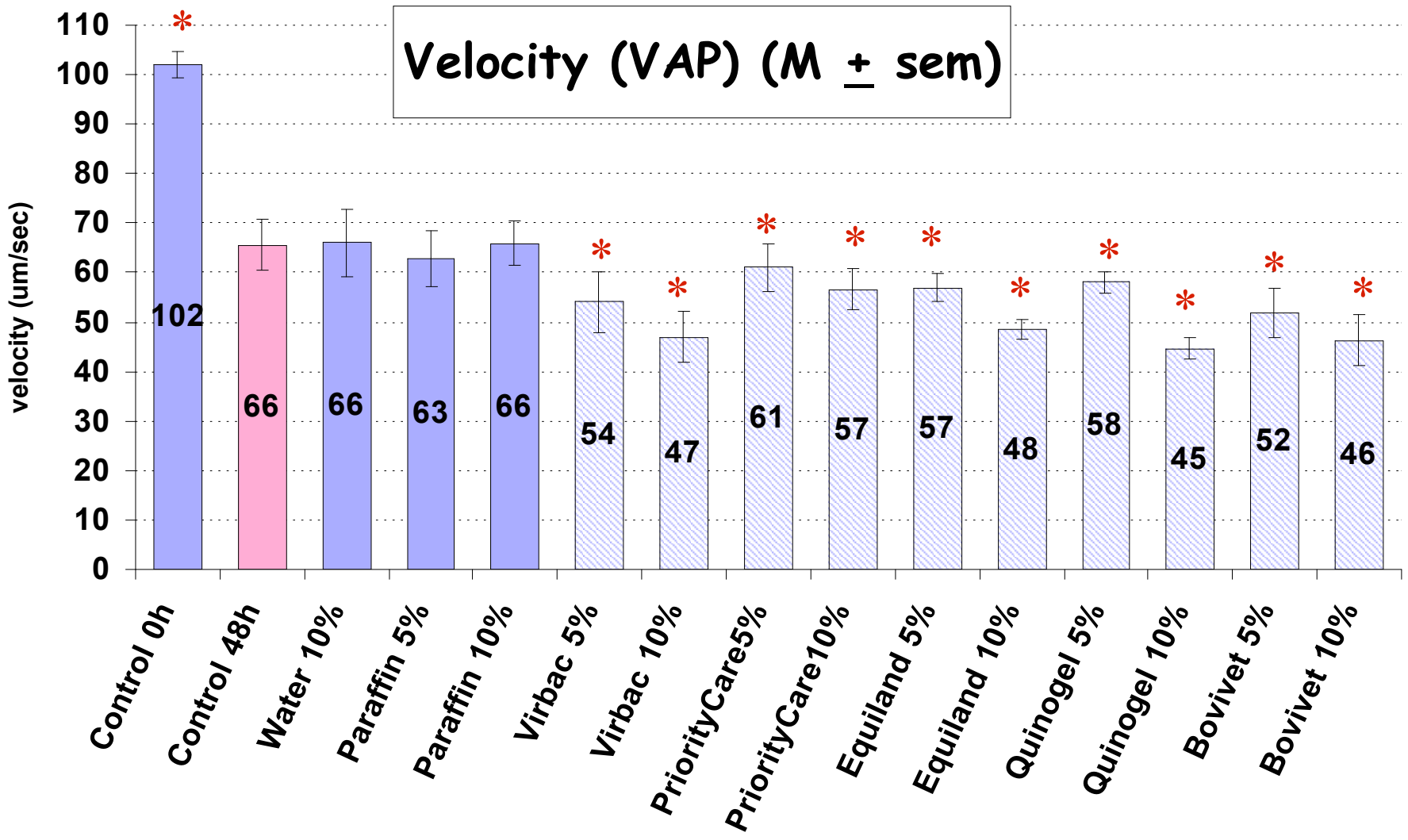
RESULTS



* : significant difference compared to 48h control

les Haras nationaux

RESULTS

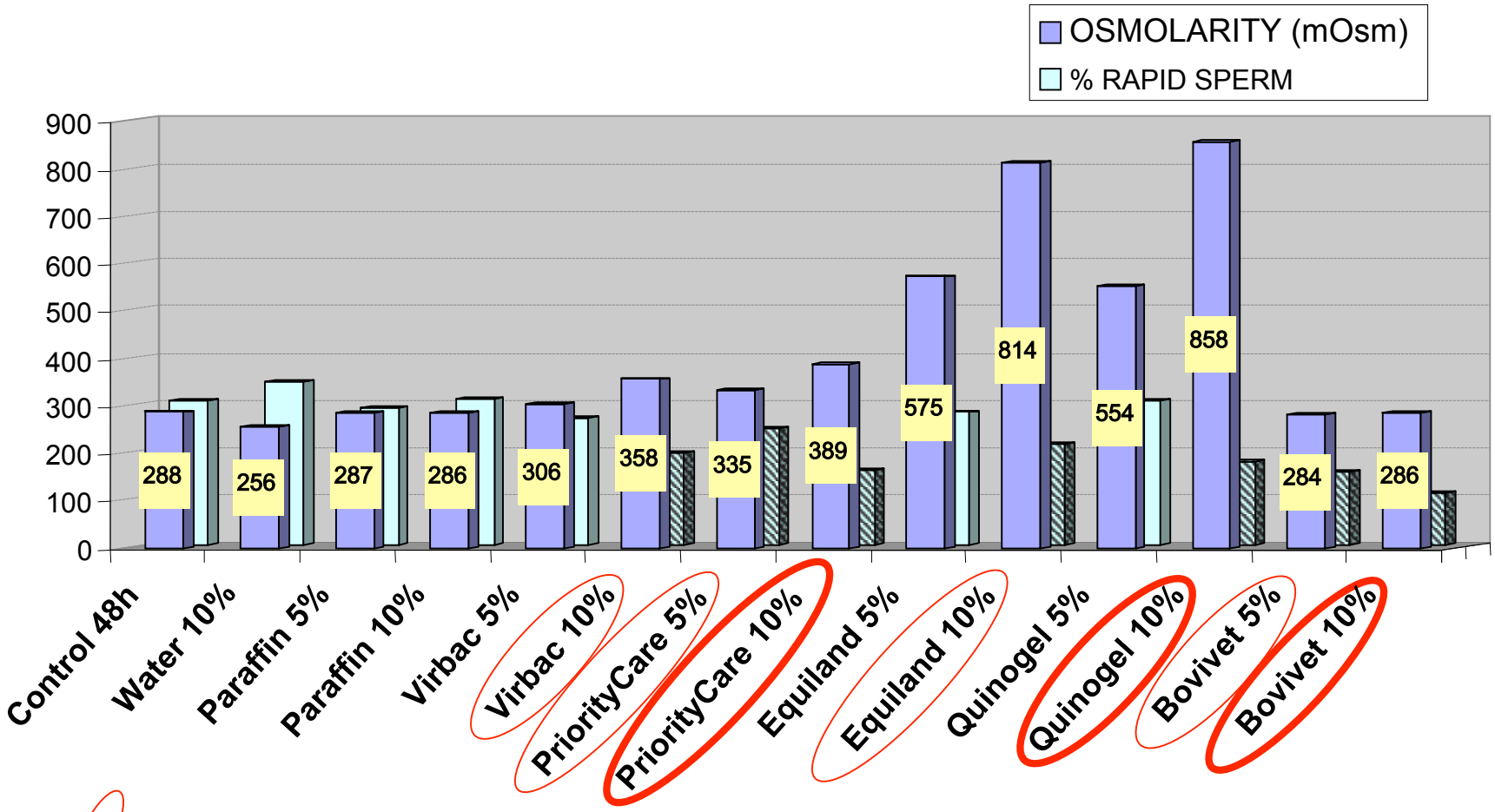


* : significant difference compared to 48h control

les Haras nationaux

Osmotic toxicity ?

No significant correlation osmolarity/motility (RAP : r=-0,23, p > 0.10)



: RAP significantly different from control

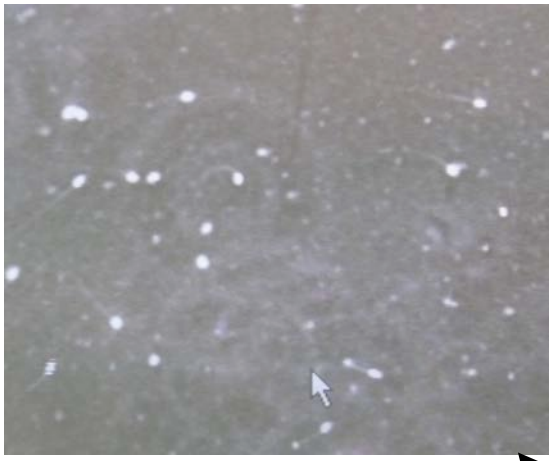
: PROG and RAP significantly different from control

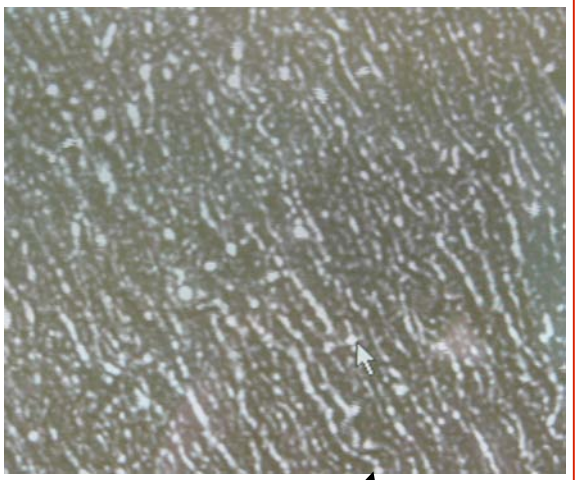
les Haras nationaux

Mechanical problem ?

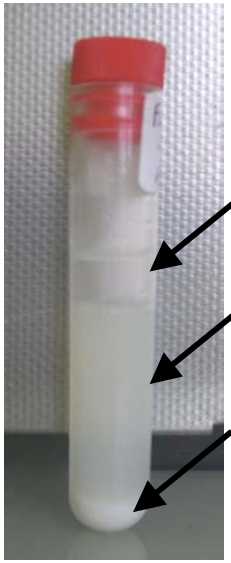
After 48h at 4°C :

10% Gel Virbac® :





10% Gel Virbac® :



After vortex :
very heterogeneous :

- areas without gel, motile sperm

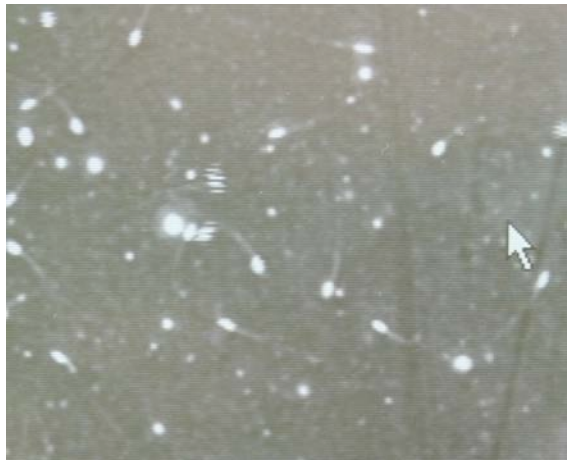
- areas with a lot of gel : sperm «trapped» in gel (non motile), computer analysis impossible
→ under-evaluation of the decrease in motility

In the uterus : ↓ number of motile sperm ?

Other lubricants : mix easily with semen

10% Quinogel®
10% Equiland
10% Priority Care :

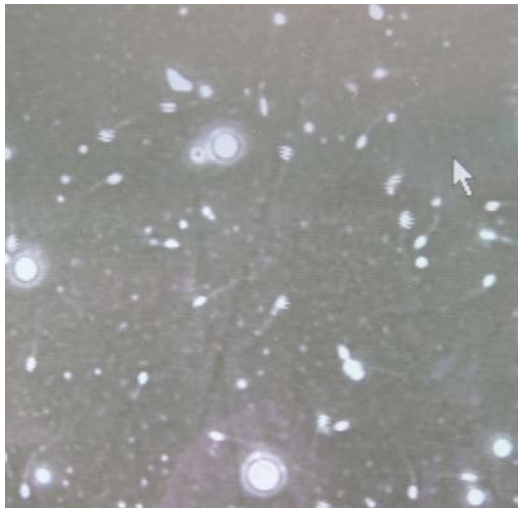
10% Bovi-vet gel® : very viscous, forming threads



Decrease in motility :

- toxic components ?
- increased viscosity ?

10% paraffin oil :



Vortex → homogeneous suspension

Emulsion of lipid globules of different size

les Haras nationaux

CONCLUSION

- After 48h storage à 4°C, motility did not differ in :
  - control extender (skim-milk + antibiotics)
  - 5% or 10% paraffin oil
  - 10% water

- When mixed with semen dose at 5 or 10%,
all the water-soluble gynaecological lubricants tested here are detrimental for sperm motility after storage

WATER-SOLUBLE LUBRICANTS :
! USE A SMALL QUANTITY

NO LUBRICANT IN THE CERVIX
Frozen semen : dose = 4 mL, 10% = 0.4 mL