



ASSESSMENT TESTS FOR OUR EXTENDERS

With the aim of guaranteeing the maximum quality of our extenders, periodical tests assess the stability of the product under extreme conditions of humidity and temperature. Our high performance extenders are also compared with competitor extenders in real doses for constant innovation and improvement of our products.

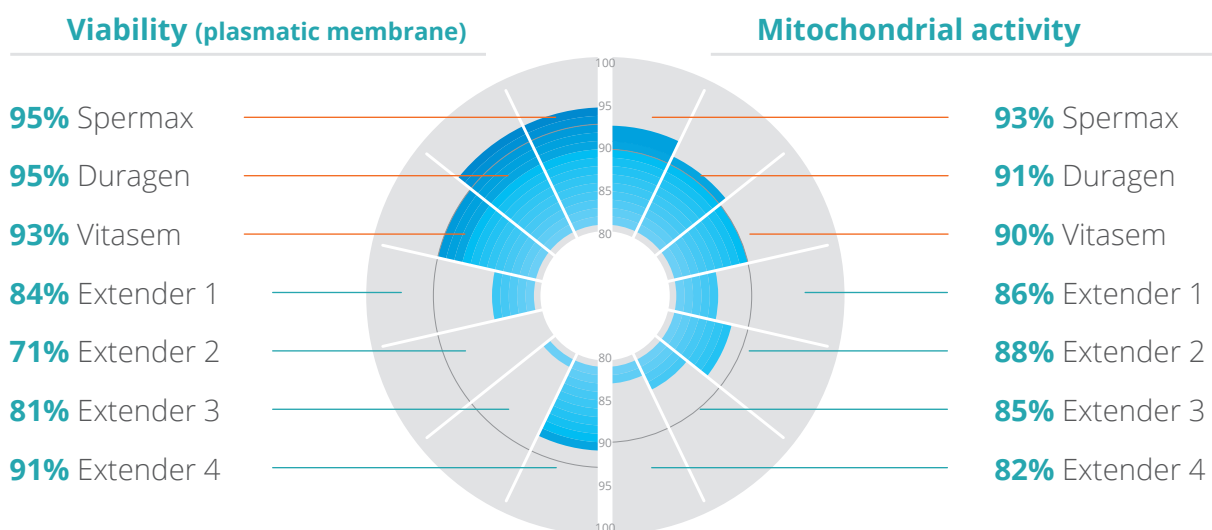
Stress Test

This test intends to check the functionality of Magapor high performance extenders (Duragen, Vitasem and Spermax) and compare it to those of different commercial extenders. Our extenders are compared with those of the competence in real semen doses stored at 15°C-17°C.

The analysis is performed at day 1, 4, 7, 8 and 11.

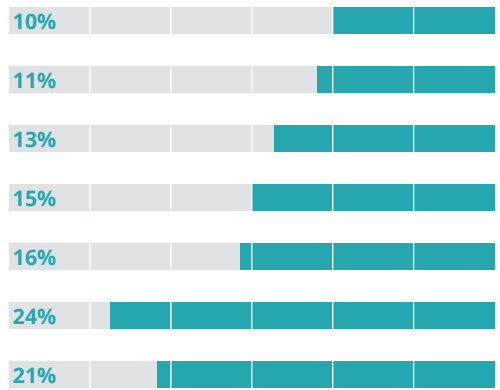
Spermax, Vitasem and Duragen extenders obtain the best results for the sperm quality parameters, maintaining them at high values, significantly superior to those of the average preservation time with regards to the competitors analyzed. They also preserve motility, sperm membranes and the acrosome state under optimal conditions and maintain mitochondrial activity and the stability of membrane lipids at long term, so spermatozoa arrive at fertilization in optimal conditions.

Spermatozoa have to reach the oocyte, but also be under optimal maturity conditions at the point of fecundation

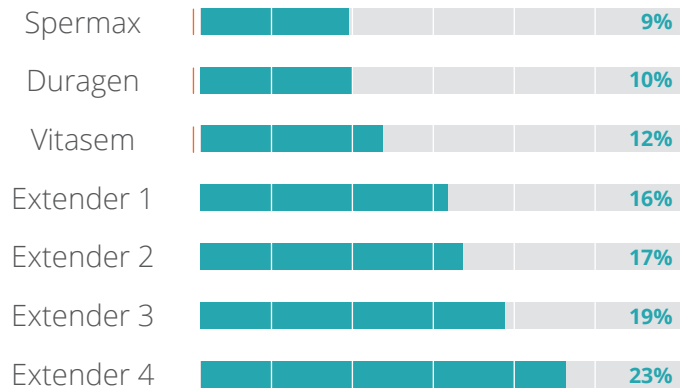


Results at day 11 of preservation, evaluated by flow cytometry against competitor extenders of extra-long term preservation (and Vitasem).

REACTED ACROSOMES

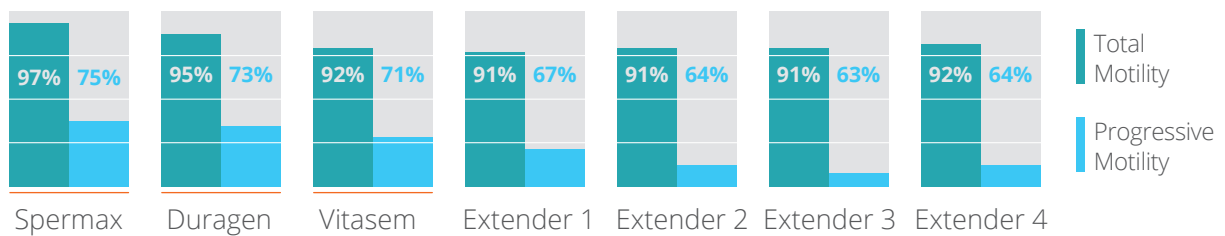


EARLY APOPTOSIS



Results at day 11 of preservation, evaluated by flow cytometry against competitor extenders of extra-long term preservation (and Vitasem).

MOTILITY



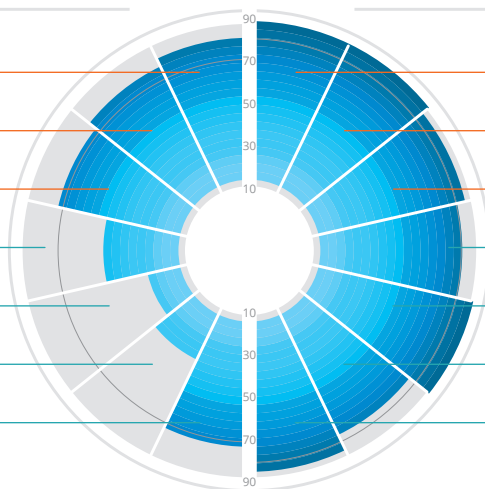
Total and progressive motility at day 11 of preservation, evaluated by CASA system against extra-long term competitor extenders (and Vitasem).

SHOST

- 82%** Spermax
- 80%** Duragen
- 76%** Vitasem
- 46%** Extender 1
- 20%** Extender 2
- 33%** Extender 3
- 71%** Extender 4

ORT

- 91%** Spermax
- 91%** Duragen
- 88%** Vitasem
- 83%** Extender 1
- 90%** Extender 2
- 79%** Extender 3
- 87%** Extender 4



SHOST and ORT results at day 11 of preservation, assessed by eosin-nigrosin stain against extra-long term competitor extenders (and Vitasem).



Stability test

Stability tests of extenders under temperature and humidity conditions.

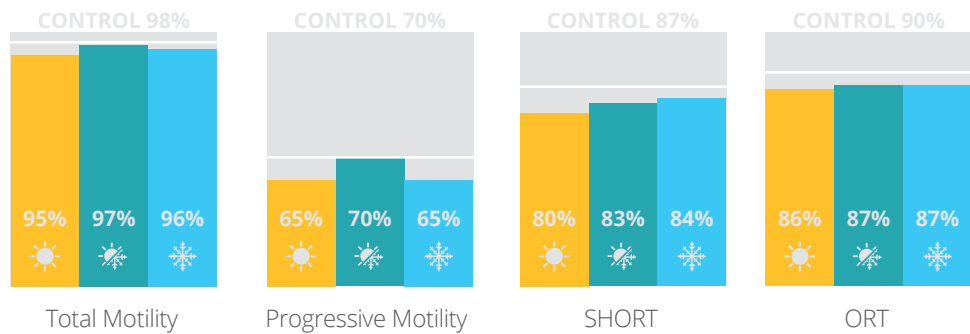
In order to evaluate the effects of temperature and humidity on extenders, samples are stored under different atmospheric conditions:

- ❄️ Cold/humidity: $\pm 5^{\circ}\text{C}$
- 🌡️ Room temperature: $\pm 20^{\circ}\text{C}$
- ☀️ Heat/ humidity: $\pm 37^{\circ}\text{C}$ and 80% humidity

Results are assessed at 3, 5 and 7 months of storage using a CASA system against a control sample, with absence of significant differences. Our extenders are stable through time under extreme humidity and temperature conditions.

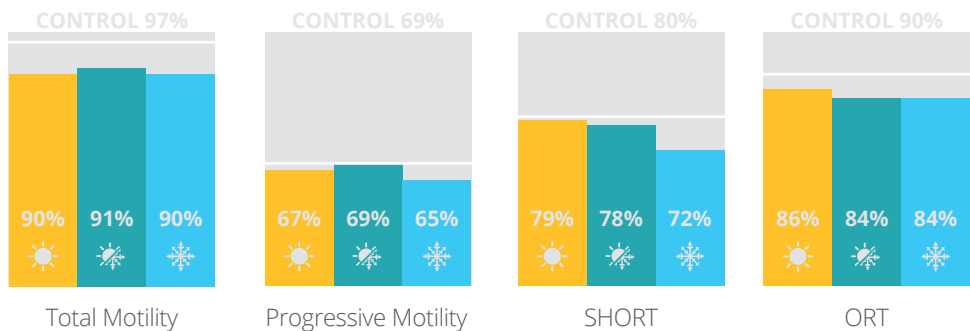
SPERMAX

Results at day 10



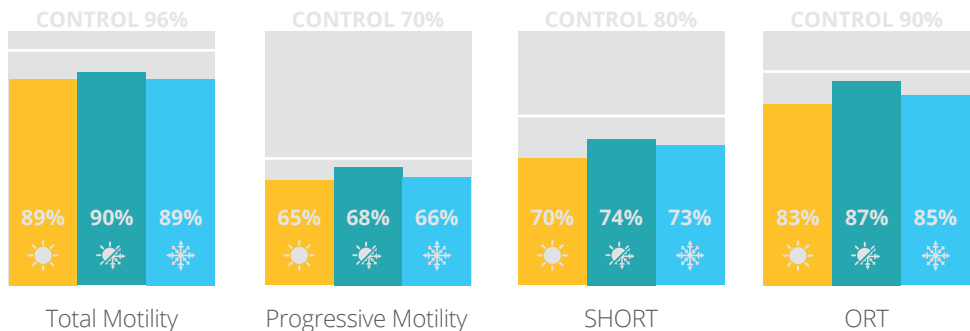
DURAGEN

Results at day 10



VITASEM

Results at day 7



Antibacterial effect test

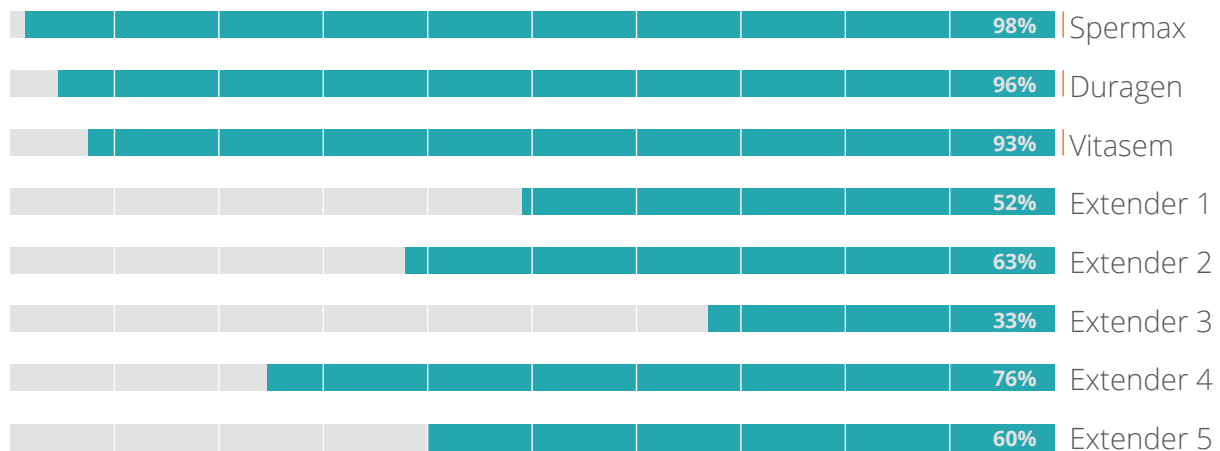
Comparison of the antibacterial effect of Duragen, Vitasem and Spermax against competitor extenders.

This research assesses the antibacterial effect of Spermax, Duragen and Vitasem in semen doses and compares it to competitor extenders from different commercial brands.

Thanks to continuous improvement and innovation, as well as to the exhaustive study of the functional groups of antibacterial substances, Magapor extenders are formulated with the most effective wide-spectrum antibiotic combinations, always complying with European Directive 90/429/EEC, being able to control bacteria of diverse type.

Comparison of our extenders and competitors in real semen doses stored at 15°C-17°C, evaluating bacterial growth 48 hours after dilution.

Correct research on the synergic effect among antibiotics prevents interaction between functional groups, increasing their antibacterial efficiency



Parameters analyzed

- Total motility (MT)
- Progressive motility (PM)
- Other kinetic parameters obtained with CASA
 - VCL: Curvilinear velocity ($\mu\text{m/s}$).
 - VSL: Straight line velocity ($\mu\text{m/s}$).
 - VAP: Average path velocity ($\mu\text{m/s}$).
 - ALH: Amplitude of lateral head displacement (μm).
 - BCF: Beat cross frequency (Hz).
 - STR: Straightness. Linearity of the average trajectory, VSL/VAP.

- oLIN: Linearity. Linearity of the curvilinear trajectory, VSL/VCL.
- WOB: Wobbliness.
- Osmotic resistance test (ORT).
- Endosmosis test (SHOST).

A flow cytometry analyzes the viability, acrosome integrity, mitochondrial potential and early apoptosis:

- Plasmatic membrane viability and acrosome integrity
- Mitochondrial activity and early apoptosis