TRIXcell Ultra

EXTRA PROTECTIVE MEDIUM

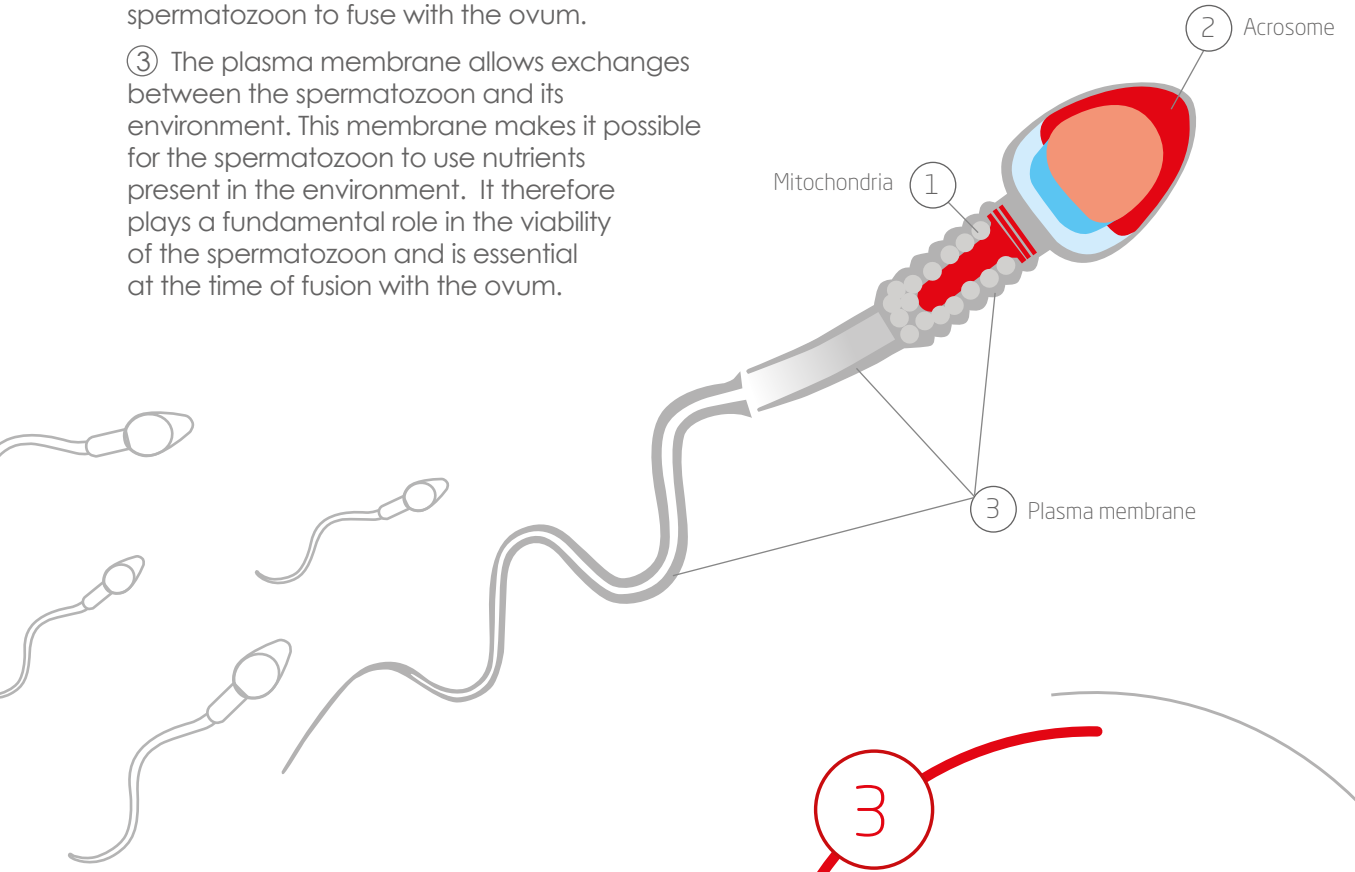
imv TECHNOLOGIES

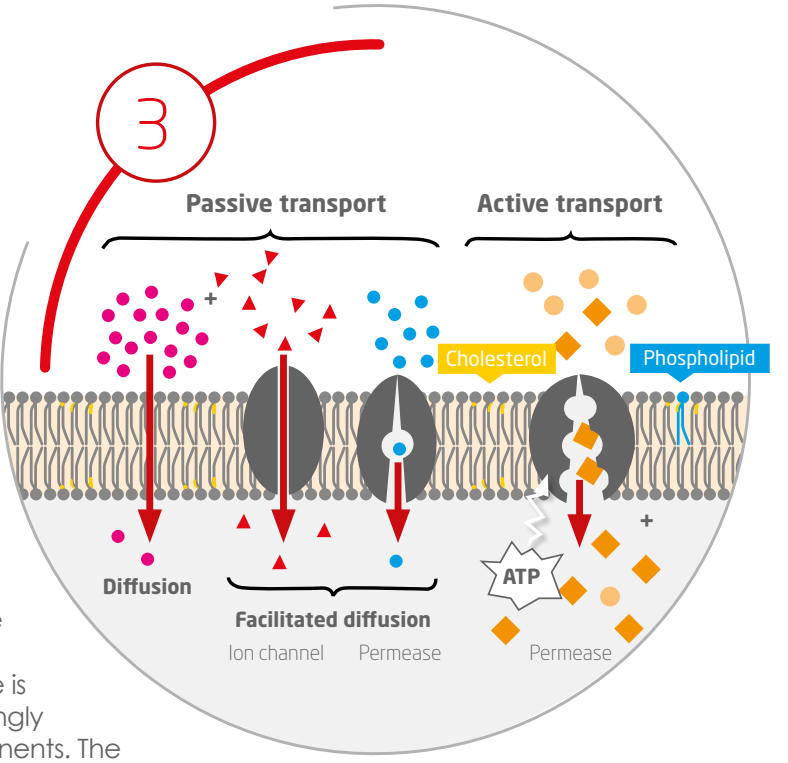
Key functions of spermatozoa

① The mitochondria, located in the middle part of the spermatozoon, produce the energy needed for cell survival and motility.

② The acrosome, located over the anterior part, contains enzymes that allow the spermatozoon to fuse with the ovum.

③ The plasma membrane allows exchanges between the spermatozoon and its environment. This membrane makes it possible for the spermatozoon to use nutrients present in the environment. It therefore plays a fundamental role in the viability of the spermatozoon and is essential at the time of fusion with the ovum.





Characteristics of swine spermatozoa

Swine spermatozoa are characterized by a high content of polyunsaturated fatty acids and a low concentration of cholesterol. This makes them more sensitive to stress, such as thermal shock, than bovine spermatozoa.

Bailey et al., 2008; Martín-Hidalgo et al., 2011; López et al., 2012; Schulze et al., 2013

Membrane functionality

The membrane allows exchanges between the cell and its environment through various types of transport. If thermal shock occurs, its structure is altered, and the membrane becomes increasingly permeable, which creates a loss of cell components. The mobility and vitality of the spermatozoa are then affected.

Drobnis et al., 1993; Johnson et al., 2000; López

TRIXcell Ultra enables improved semen dilution strategies

Designed for high-value semen which must retain its quality whatever the conditions, TRIXcell Ultra features all the technological advances developed by IMV.

TRIXcell Ultra: saving time

TRIXcell Ultra, used in two-step dilution protocols, can help shorten dose cooling periods.

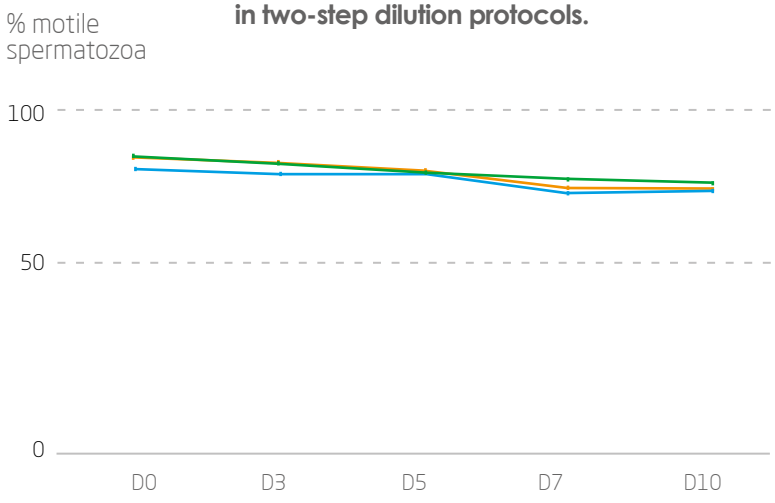
Conventional one-step dilution

TRIXcell Ultra two-step dilution

**IMV recommendation*

TRIXcell Ultra gives flexibility to staff schedules.

Sperm motility using different temperatures in two-step dilution protocols.



Materials and Methods

- 4 boars
- Spermatozoa concentration : 30 M/ml
- First dilution 1:1 with media at 34°C. Standing time : 25 min. Then final dilution with different temperatures: 17°C, 25°C or 34°C
- Final storage at 17°C.

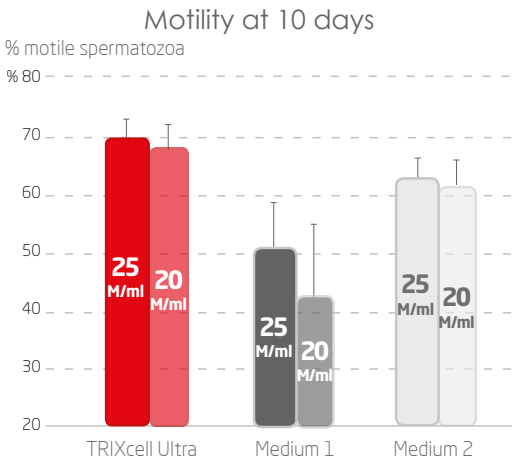
Thanks to the good protection of TRIXcell Ultra, the motility is maintained whatever the temperature for the final dilution.
TRIXcell Ultra protects sperm through accelerated temperature decreases.

TRIXcell Ultra protects sperm motility regardless of the final temperature used in two-step dilution protocols.

TRIXcell Ultra: the Low Dose solution

TRIXcell Ultra helps decrease the number of sperm per dose.
The usual concentration of spermatozoa is 30 M/ml. TRIXcell Ultra helps reduce the concentration to 25 or 20 M/ml while maintaining sperm quality parameters. TRIXcell Ultra helps produce more doses with the same quantity of semen or the same number of boars.

TRIXcell Ultra preserves sperm quality even for low concentration at the opposite to other comparable media.



Materials and Methods

- 3 groups of 3 boars
  Spermatozoa concentration : 25 M/ml or 20 M/ml
- Storage at 17°C for 10 days

Bioactivator Ultra and Bioshield optimise TRIXcell Ultra's performance

Bioactivator Ultra is a biological compound that stimulates the motility of spermatozoa, promotes ovum penetration, and ultimately improves fertility. Bioactivator Ultra maintains the properties of Bioactivator, along with a protective role.
This improved molecule is more effective.

	# Sows (AI)	% Farrowing rate	Piglets born alive	Fertility index	
Control (BTS)	356	78,37	11,74	920	
Control (BTS) + BioActivator	360	84,72	11,6	982	**+6%**

Bio ACTIVATOR ULTRA

Bioshield is a unique protein compound that protects membranes and maintains their structure over time. It also acts as a fatty acid transport agent.

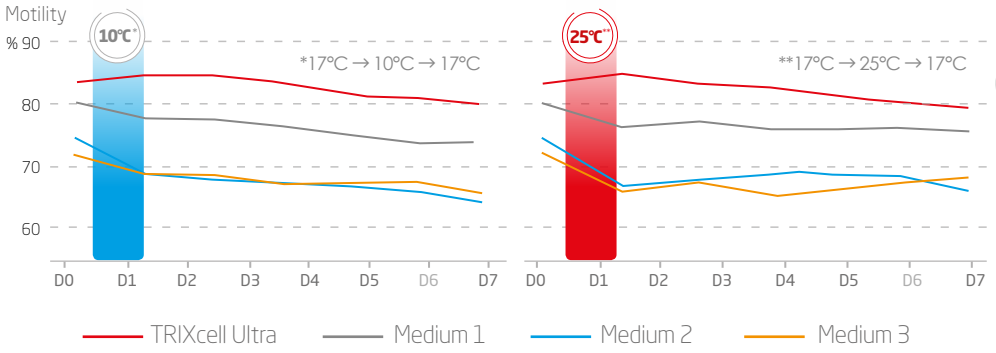
These combined properties offer real advantages: protection against temperature variations and mechanical stress, increased protection against oxidation, slower capacitation induction, improved real motility (% of progressive spermatozoa) and improved agglutination control.

	# Sows (AI)	% Farrow rate	Piglets born alive	Fertility Index	
Control	163 453	86	14	1 232	
Control + BioShield	44 370	91	14,7	1 337	**+8.5%**

Bio SHIELD

TRIXcell Ultra: protects spermatozoa during thermal stress

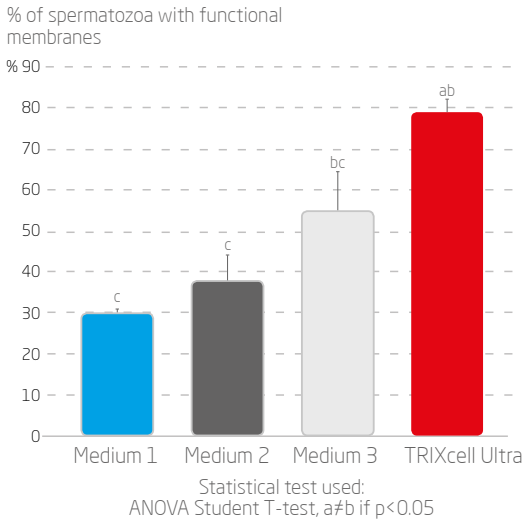
Regardless of precautions taken during transport, semen is never safe from thermal shock that may cause damage to spermatozoa. TRIXcell Ultra protects spermatozoa from stress and maintains the quality of the semen even after thermal stress.



Spermatozoa motility after stress at 10°C and at 25°C

Materials and methods
- 3 groups of 3 boars
- Spermatozoa concentration: 30 M / mL
- Storage for 12 hr at 17 °C
- Thermal stress at 10 °C or 25 °C for 16 hr
- Return to 17 °C

TRIXcell Ultra: an extra protective medium

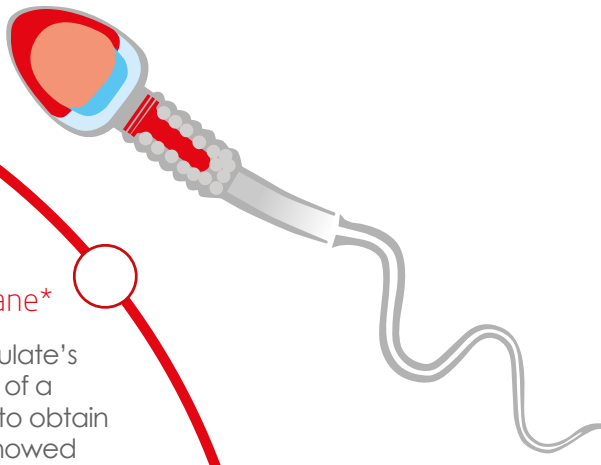


The results of the short hypoosmotic swelling test (sHOST) on Day 7 show that TRIXcell Ultra maintains the integrity of the plasma membrane. This allows sperm to resist the detrimental effects of stress, while carrying out normal metabolic processes with the media around it.

To conduct its study, IMV used the same protocol that was used in the study by *B. Pérez-Llano et al.* (see below). This study shows that the sHOST test accurately reflects the level of integrity of the plasma membrane of spermatozoa.

sHOST result on Day 7

Material and method
- 3 groups of 3 boards
- Spermatozoa concentration : 30 M / ml
- Storage at 17 °C



sHOST,

a reliable test for measuring the integrity of the plasma membrane*

This study was designed to explore the relationship between the ejaculate's response to a hypoosmotic swelling test (HOST) and the *in vivo* fertility of a group of 38 boars. Two hundred eighty-eight sows were inseminated to obtain the *in vivo* data on fertility and litter size. On their own, sHOST results showed a significant positive correlation with the *in vivo* fertility data ($r=0.43$, $p<0.01$).

This study highlights that the integrity of the plasma membrane plays an essential role in the status of spermatozoa. The sHOST can therefore provide an objective measurement of semen storage quality.

*A short hypoosmotic swelling test for the prediction of boar sperm fertility (B. Pérez-Llano, J.L. Lorenzo, P. Yenes, A. Trejo and P. García-Casado), 2001.

Production and quality control

The IMV media production laboratory was designed and developed to exceed quality assurance standards.

Production in a controlled setting

Our media production laboratory is ISO 9001 approved and certified. The center is equipped with an air filtering system and a class 100 laminar flow hood. Temperature, humidity, and sterility are regularly controlled to ensure that media are produced under the best possible conditions.

Ongoing control of production

All of our components meet the standards of at least one pharmacopoeia system. Each and every lot of end product is inspected based on its appearance, its packaging, and its physical-chemical properties.

In vitro testing and biocontamination analyses are also carried out on all of our lots.

Product reference

TRIXcell Ultra

1L / sold by 100 - 028387
5L / sold by 40 - 028388
50L / sold by 4 - 028389
100L / sold by 30 - 028390