

maXipig⁶

Enlightening Fertility
Boar Semen Light Activation



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IUL SA

- 30 years in the market, worldwide
- **Microbiology Lab equipment**
- vPCR – viability – photobiology
- In 2014 we start research with

Autonomous University of Barcelona on

Light effects on Spermatozoa

Scientific Basis

Light Stimulation of Spermatozoa

- Lubart, R., Friedmann, H., Levinshal, T., Lavi, R. & Breibart, H. Effect of light on calcium transport in bull sperm cells. *J. Photochem. Photobiol. B* **15**, 337–341 (1992).
- Wenbin, Y. *et al.* Effects of laser radiation on Saanen buck's sperm energy metabolism. Proc. 6th Int. Conf. Goats. Beijing, China. May 5–11 (1996).
- Abdel-Salam, Z. & Harith, M. A. Laser researches on livestock semen and oocytes: a brief review. *J. Adv. Res.* **6**, 311–317 (2015).

Light Stimulation of Spermatozoa

IUL, the University of Barcelona, and the University of Oxford published together their results in march 2016

- Yeste, M. *et al.* Specific LED-based red light photo-stimulation procedures improve overall sperm function and reproductive performance of boar ejaculates. *Sci. Rep.* **6**, 22569 (2016).

Light Stimulation of Spermatozoa

IUL together with the University still work together to exactly know the scientific reason that improves irradiated semen performance.

Working now in 2 hypothesis:

- **Opsins – Transducin**
- **Cytochrome C – Electron chain**

In vitro Trials

Improving Sperm Resistance

Viability following incubation at 37°C in function of time

TIME	CONTROL	maXipig®	SIGNIFICANCE
0 min.	93,5 ±2,0%	92,1 ±1,6%	NS
15 min.	92,8 ±2,4%	93,0 ±1,1%	NS
30 min	92,1 ±1,9%	93,0 ±2,1%	NS
60 min	66,8 ±1,0%	90,5 ±1,9%	*
90 min	60,3 ±1,2%	94,6 ±2,3%	*

Summary of results published in <https://www.nature.com/articles/srep22569>

Improving Sperm Resistance

Acrosome integrity following incubation at 37°C in function of time

TIME	CONTROL	maXipig®	SIGNIFICANCE
0 min.	95,0 ±2,1%	95,8 ±2,3%	NS
15 min.	94,1 ±2,0%	95,8 ±2,3%	NS
30 min	93,7 ±1,5%	95,0 ±1,9%	NS
60 min	85,1 ±1,1%	96,3 ±2,4%	*
90 min	70,7 ±1,1%	92,8 ±2,5%	*

Summary of results published in <https://www.nature.com/articles/srep22569>

Improving Sperm Resistance

Total Motility following incubation at 37°C in function of time

Time	CONTROL	maXipig®	SIGNIFICANCE
0 min.	95,2 ±2,2%	95,4 ±2,1%	NS
15 min.	62,1 ±6,4%	67,9 ±7,8%	NS
30 min	62,8 ±5,1%	63,0 ±6,1%	NS
60 min	45,9 ±6,2%	67,9 ±6,0%	*
90 min	41,8 ±6,7%	79,6 ±7,0%	*

Summary of results published in <https://www.nature.com/articles/srep22569>

In vivo Trials

Improving Fertility and Litter size

Treatment	N	Farrowing Rate (%)	Total-born Piglets	Live-born Piglets
Control	800	83,7	13,5±0,2	12,7±0,2
maXipig®	520	88,1*	14,9±0,3*	14,0±0,2*

Summary of results published in IPVS 2016 Dublin http://imgpublic.mci-group.com/ie/PCO/IPVS_ESPHM_2016_Book_of_Abstracts.pdf

Improving Fertility and Litter size

Treatment	N	Farrowing Rate (%)	Live-born Piglets
Control	6833	90,0	12,1±0,2
maXipig[®]	3044	92,3*	12,9±0,2*

Summary of results published in IPVS 2016 Dublin http://imgpublic.mci-group.com/ie/PCO/IPVS_ESPHM_2016_Book_of_Abstracts.pdf

The logo for maXipig[®], featuring the word 'maXipig' in a teal font with a stylized 'X' and a superscripted '6' to the right.

Improving Fertility and Litter size

Treatment	N	Farrowing Rate (%)	Total-born Piglets
Control	8258	87,4	13,2±0,8
maXipig[®]	4379	92,1*	14,1±0,6*

Summary of results published in AIVets 2017 Aranjuez (Spain) http://congress2017.anps.es/readcontents.php?file=webstructure/program_29_09.pdf

Success stories

Improving Fertility and Litter size

Treatment	N	Farrowing Rate (%)	Total-born Piglets
Control	103	94,15	15,60
maXipig[®]	103	99,04	16,38

Belgium

Hypor Genetic Farm

He is working with the maXipig since February 2017

Improving Fertility and Litter size

Treatment	N	Fertility Rate (%)	Live-born Piglets
Control	288	90,3	13,74
maXipig[®]	367	95,1	14,46

Spain

PIC Genetic Farm

He is working with the maXipig since November 2016

Improving Fertility and Litter size

Treatment	N	Fertility Rate (%)	Total-born Piglets
Control	541	86,69	16,98
maXipig®	660	93,03	17,69

Finland

Danbred Genetic Farm

He is working with the maXipig since January 2017

Improving Fertility and Litter size

Treatment	N	Farrowing Rate (%)	Total-born Piglets
Control	1023	87,9	15,29
maXipig®	982	89,6	15,54

Spain

He is working with the maXipig since July 2017

Improving Fertility and Litter size

- There are now 50 units working in commercial farms
- Late results on Fertility coming from UK, France, Portugal show 6-8% increase