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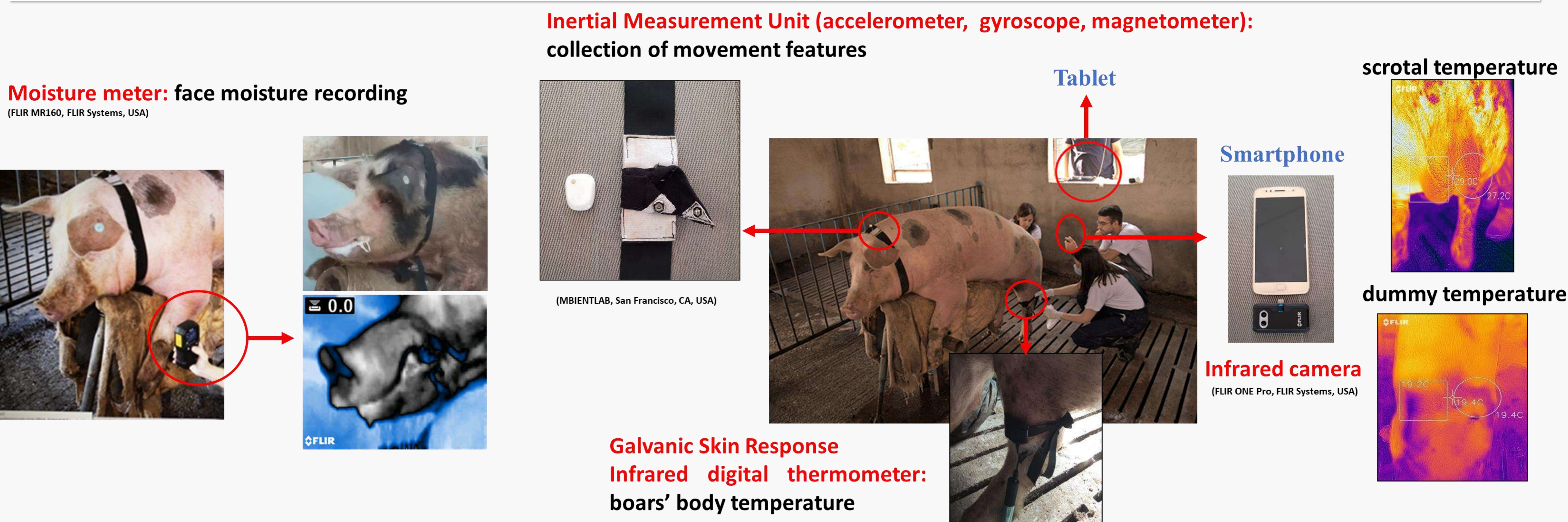
## Introduction

Sperm quality and fertilizing ability are affected by animals' health and stress status. The aim of the study was to investigate the relation of semen quality with boar behavior immediately before and during ejaculation that was recorded by modern technological equipment.

## Materials and methods

**Semen samples:** 94 entire semen samples, extended in final concentration of  $30 \times 10^6$  sperm/mL, from 5 boars

**Sperm analysis:** a) CASA motility and kinematics, b) viability and morphology (eosin-nigrosin), c) membrane biochemical activity (HOST), d) DNA fragmentation (acridine orange)



Files were processed using scripts in Matlab 2021 (MathWorks, Natick, Massachusetts) to derive the necessary indices (biomarkers). The statistical analysis was performed in the Statistics and Machine Learning Toolbox of Matlab 2021 using a linear mixed effects model.

## Results

Variables		Regression Coefficient	p-Value (n=94)	R-Squared
<b>Dummy temperature</b>	Progressive (%)	-1,298	<0,001	0,637
	VCL ( $\mu\text{m/s}$ )	-0,796	<0,001	0,625
	VSL ( $\mu\text{m/s}$ )	-0,369	<0,001	0,554
	ALH ( $\mu\text{m}$ )	-0,046	<0,001	0,602
	BCF (Hz)	-0,022	0,005	0,504
	Viability (%)	-0,006	<0,001	0,685
	Norm. morph. (%)	0,005	<0,001	0,586
<b>Boar temperature</b>	Progressive (%)	-3,697	<0,001	0,546
	VCL ( $\mu\text{m/s}$ )	-2,378	<0,001	0,596
	VSL ( $\mu\text{m/s}$ )	-0,911	0,007	0,515
	ALH ( $\mu\text{m}$ )	-0,140	<0,001	0,575
	BCF (Hz)	-0,067	0,016	0,506
<b>Scrotal temperature</b>	Progressive (%)	-2,064	<0,001	0,543
	VCL ( $\mu\text{m/s}$ )	-1,289	0,555	0,555
	VSL ( $\mu\text{m/s}$ )	-0,569	0,510	0,510
	ALH ( $\mu\text{m}$ )	-0,073	0,518	0,518
	Semen volume (mL)	-4,630	0,756	0,756
<b>Overall dynamic body acceleration</b>	Tot. ejac. time (min)	26,967	<0,001	0,608
<b>Raw acceleration</b>	VAP ( $\mu\text{m/s}$ )	15,980	0,026	0,533
	Tot. ejac. time (min)	40,403	<0,001	0,686

## Conclusions

In conclusion, biomedical techniques, such as overall dynamic body acceleration and raw acceleration support the evaluation of boar semen production capacity, providing useful information about semen quality.