



Thriving or Striving: Comparing IUGR, LBW and Normal Piglets within the First 24 Hours.



M. Loyens, L. Van Bockstal, S. Prims, S. Van Cruchten, C. Van Ginneken

Laboratory of Comparative Perinatal Development, Department of Veterinary Sciences, Faculty of Biomedical, Pharmaceutical and Veterinary Sciences
University of Antwerp, Campus Drie Eiken, 2610 Wilrijk, Belgium
Corresponding author: marlotte.loyens@uantwerpen.be

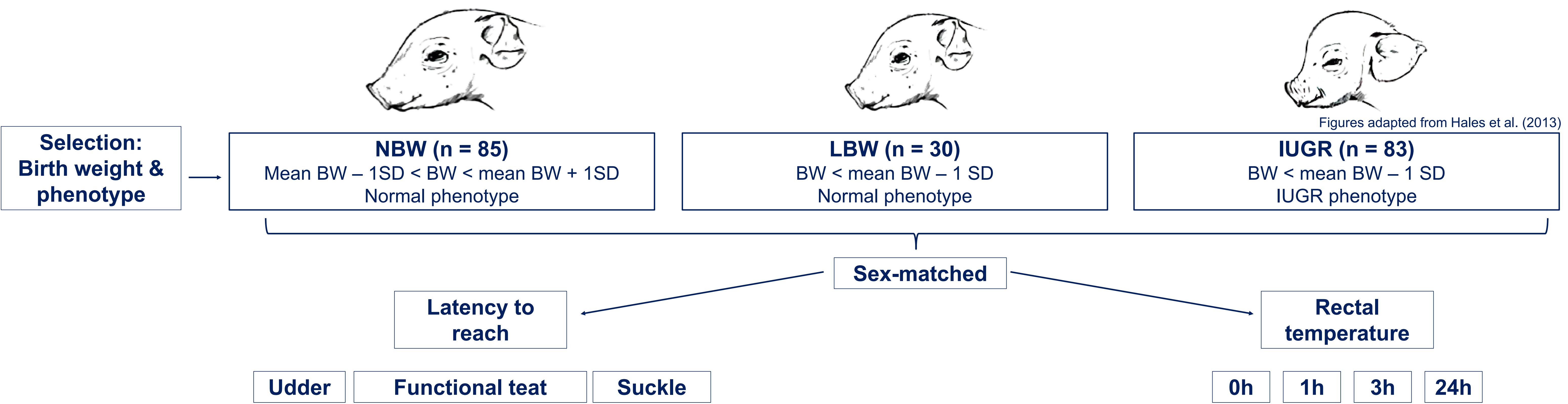
Introduction

The introduction of hyperprolific sows has led to an increase in litter sizes, an increase in piglets born with **low birth weight (LBW)**, more significant birth weight variability per litter, higher pre-weaning mortality, and a higher prevalence of piglets born with **intra-uterine growth restriction (IUGR)**. IUGR refers to a condition where offspring encounters compromised *in-utero* growth. As a result, these piglets commonly face an **increased pre-weaning mortality risk**.

Aim

This study examines whether birth weight alone or combined **with other factors** (a.o. IUGR morphology, sex) contributes to the **increased mortality risk, behavioral traits, weight gain, and body temperature evolution**.

Materials and Methods



Results

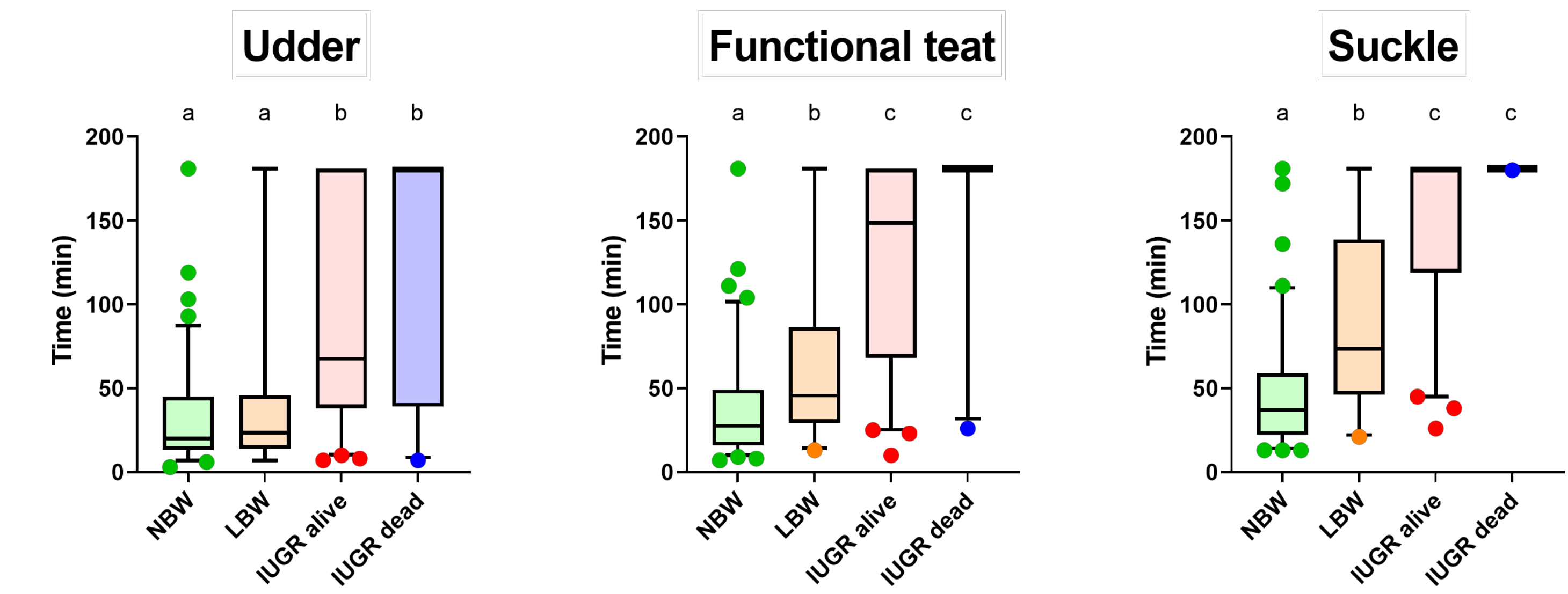
Body weight and mortality

The mean birth weight and weight after 24 hours differed across piglet groups ($P < 0.0001$). After 24 hours, **NBW piglets** showed an **increase** in body weight, while **LBW and IUGR piglets** exhibited **weight reduction**. Within 24 hours, **28% of IUGR piglets had died**, while there were no reported deaths among NBW or LBW piglets. There were **no sex differences** noted.

	NBW	LBW	IUGR	P-value
Birth weight, kg	1.27 ± 0.21^a	0.76 ± 0.09^b	0.57 ± 0.12^c	< 0.0001
Weight after 24h, kg	1.32 ± 0.24^a	0.71 ± 0.11^b	0.53 ± 0.13^c	< 0.0001
Weight gain/loss	↑	↓	↓	/
Mortality rate, %	0 ^a	0 ^a	28 ^b	0.0008

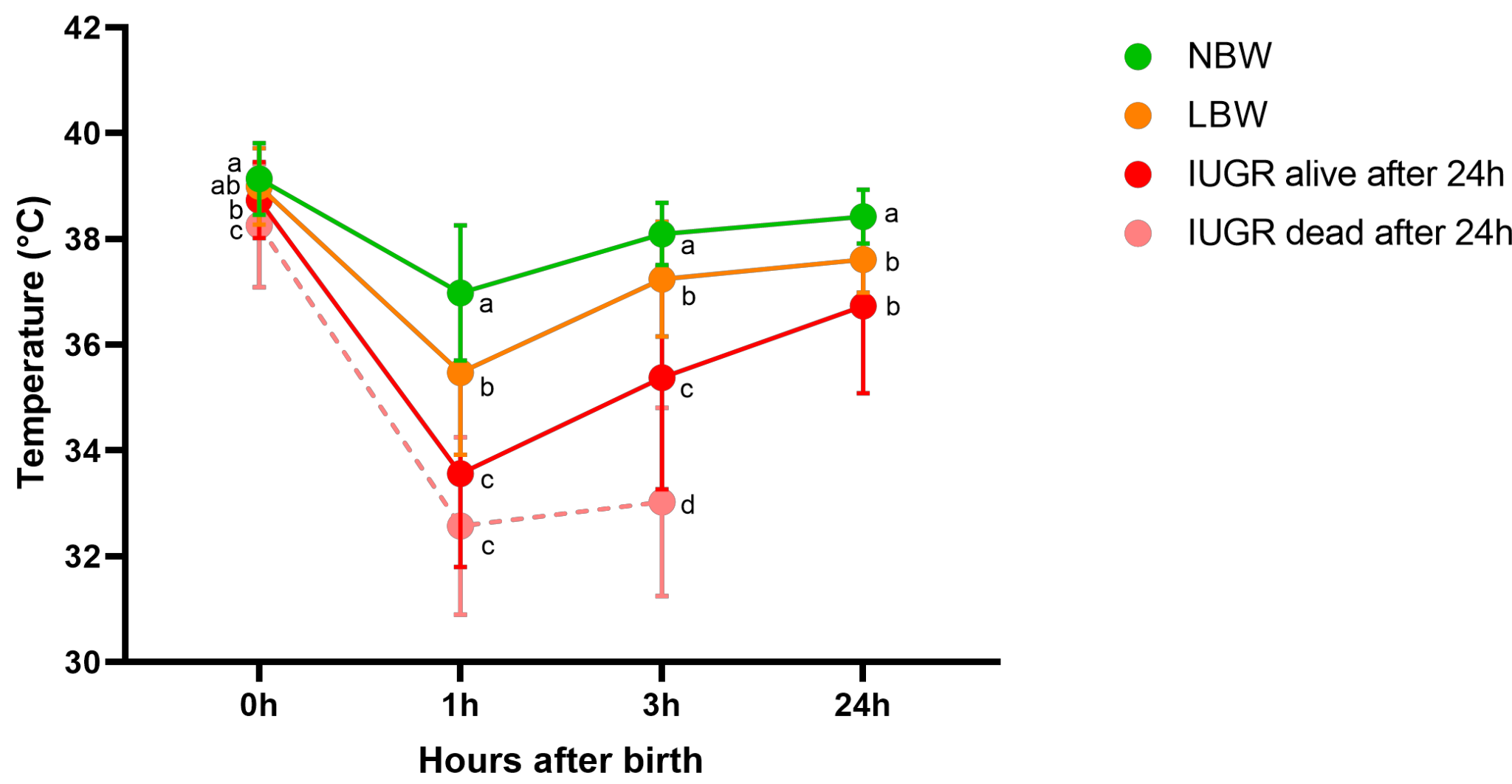
Latency to reach (Cut-off of 3 hours)

NBW piglets were the **fastest** to reach the udder, a functional teat, and start suckling. **LBW piglets** were moderately fast, while **IUGR piglets** were the **slowest** ($P < 0.0001$). Some of the IUGR piglets reached the udder but did not find a functional teat or start to suckle. There were **no sex differences** noted.



Rectal temperature

There was a **consistent pattern** regarding body temperature. **NBW piglets** had the **highest body temperature values** at all time points, followed by **LBW piglets**, with **IUGR piglets** having the **lowest temperatures** ($P < 0.0001$). IUGR piglets that died within the first 24 hours after birth showed a drop in body temperature after 1 hour postpartum, which did not increase in the following hours. There were **no sex differences** noted.



Conclusions

- Body weight, latency to reach, and rectal temperature** can be considered as factors in determining **piglet mortality risk** within their first 24 hours.
- IUGR piglets** demonstrated **poorer performance** in suckling behavior and temperature regulation during the first 24 hours **compared to LBW and NBW piglets**, indicating reduced vitality. This vulnerability puts IUGR piglets at **higher risk of succumbing** because of the chilling, starvation, and crushing triad.
- Implementing intervention strategies** would be **more beneficial for LBW piglets**, given their **higher vitality** during this critical period compared to IUGR piglets.

Acknowledgement

The authors would like to thank Katty Huybrechts and Gunther Vrolix for their technical support. They would also like to thank Gunther Vrolix, Laura Buysens, Marina Stroe, Elias Bauwens, and Kristel Vanderauwera for their support during the data collection.



University of Antwerp
Faculty of Pharmaceutical, Biomedical and Veterinary Sciences