

Effects of energy supplementation to low-birth weight neonatal piglets on their survival, growth and blood glucose level.

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The context

- Large litters increased
 - Litter weight variability
 - Prevalence of low birth weight piglets
- Neonatal mortality
 - Low body energy reserves

Energy reserves of the newborn piglet

Source	Type	Available energy
Liver	Glycogen	43 kJ/kg BW
Muscle	Glycogen	209 kJ/kg BW
Body (non-structural body fat)	Lipids	175 kJ/kg BW

Total

427 kJ/kg BW

(Mellor and Cockburn, 1986)

The context

- Large litters increased
 - Litter weight variability
 - Prevalence of low birth weight piglets
- Neonatal mortality
 - Low body energy reserves
 - Failure to acquire energy (Thorup et al., 2015)
 - Low birth weight piglets = rapid depletion

Energy needs of the newborn piglet

Ambient temperature range	Energy required	Sustained heat production autonomy	
		Normal birth weight piglet	IUGR piglet
32-38°C	9.5 kJ/h/kg BW	31 h	5 h
18-26°C	27 kJ/h/kg BW	15 h	3 h
0-10°C	43 kJ/h/kg BW	58 h	7 h

(Mellor and Cockburn, 1986)

Energy supplementation at birth

- Increases survival and growth (Decleek et al., 2016)
- Medium-chain fatty acids (Herpin et al., 2002; Lepine et al., 1989)
- Commercially available products

Assess the effects of energy supplementation
Compare an elaborated product to a raw source of energy

PILOT STUDY

Methods

27 sows – 3 weeks batch farrow



Birth-Weight < 1.10 kg
(30% total born)

3h post-partum



2 ml



0 KJ/2ml



74 KJ/2ml



71 KJ/2ml

Methods

- Piglets left on their dam
 - Random assignment within sow
 - Litter size = 13 piglets
- Targeted for birth weight < 1.10 kg
- Recruitment
 - Live birth
 - <3h post-partum (video camera)

Coconut = 35 piglets (M:F=0.84)

Water = 35 piglets (M:F=0.94)

Energyn = 34 piglets (M:F=1.13)

Data collection and analysis

■ Data collection:

- Weights : D0 (birth), D1, D7, D14, D21, Weaning
- Glucose: 24 h after supplementation (D1)
- Mortality: as occurred

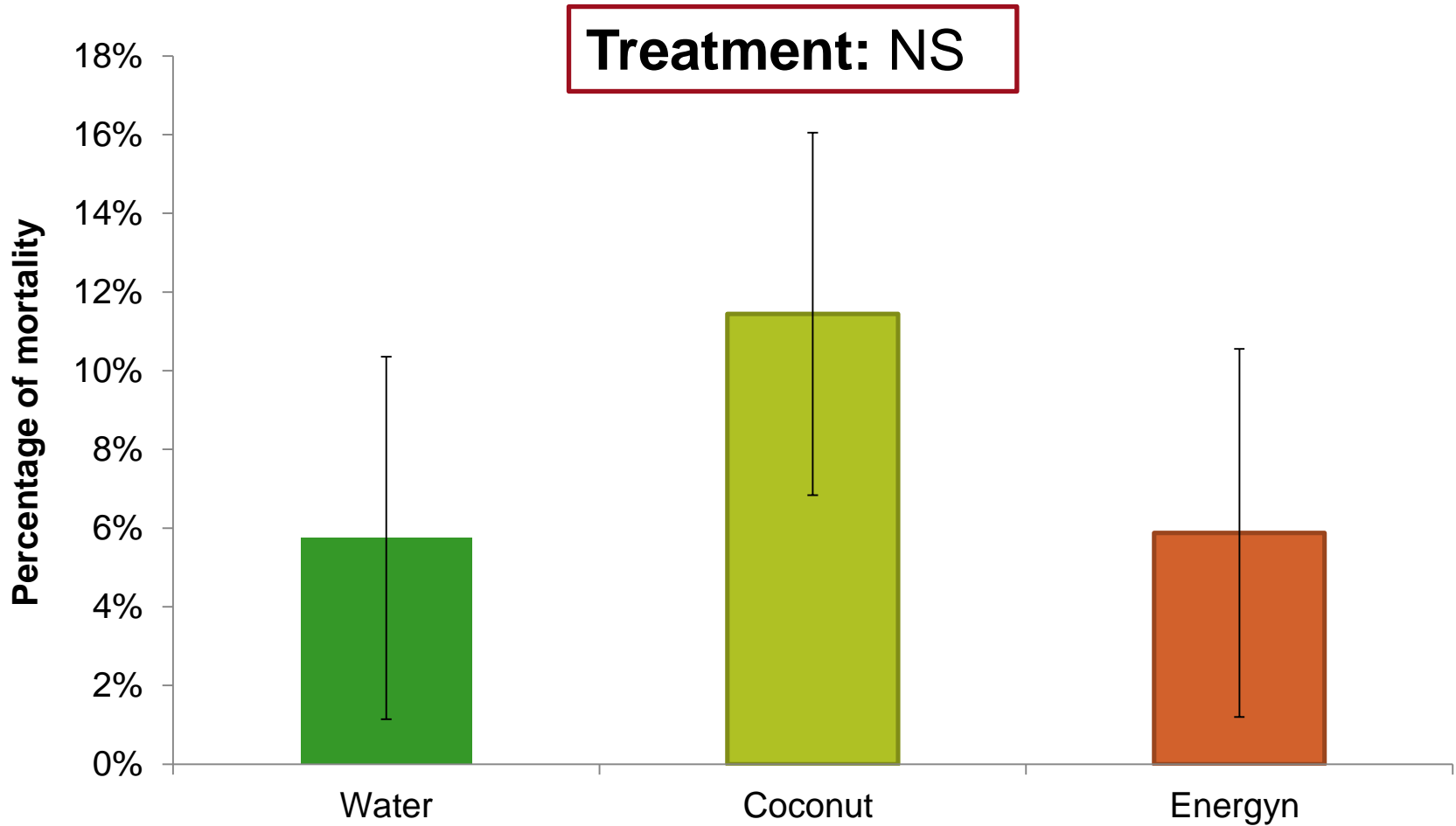
■ Statistics: General Linear Model

- random effect of **sow**
- repeated effect of **day**

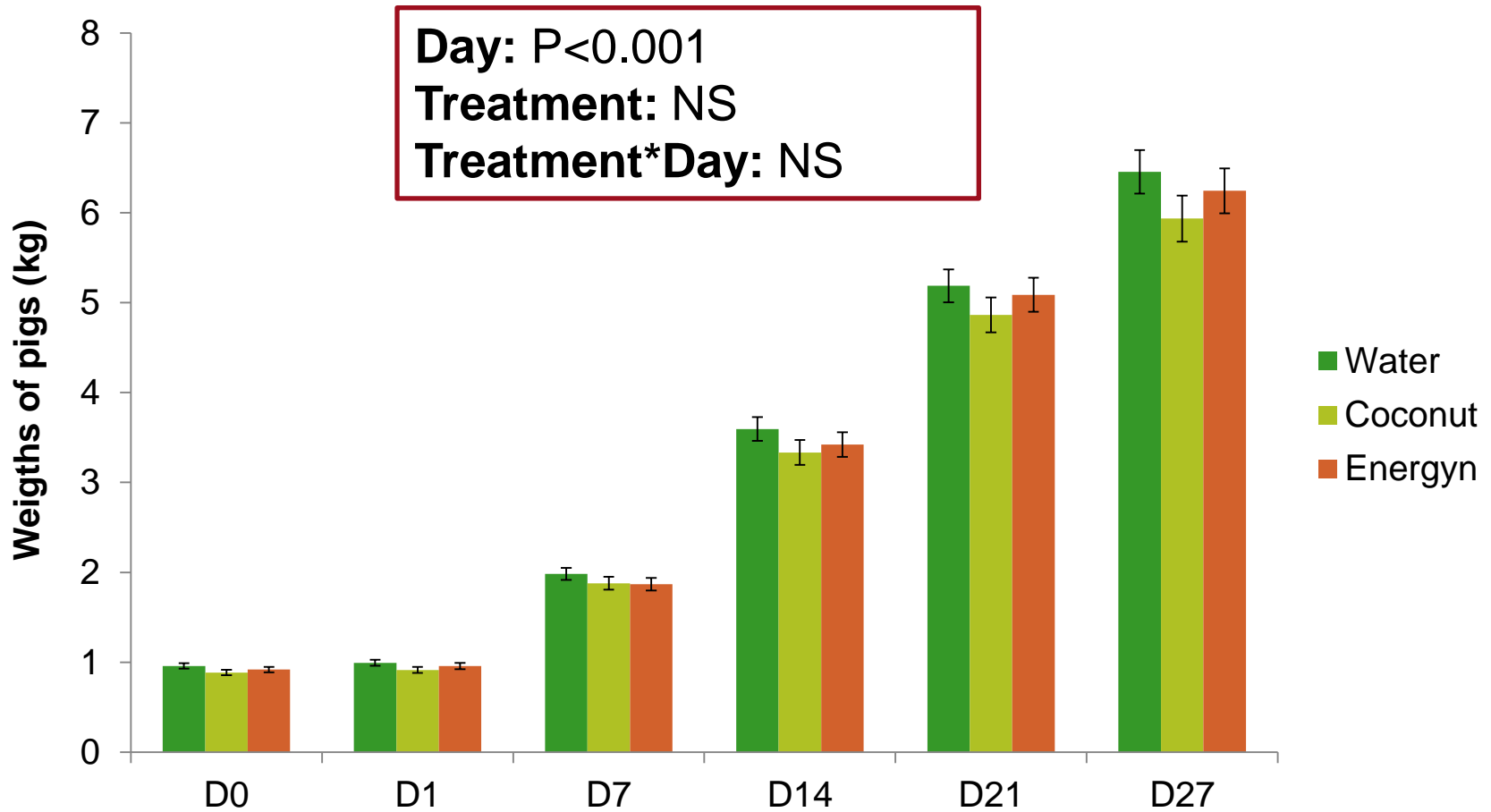


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Survival

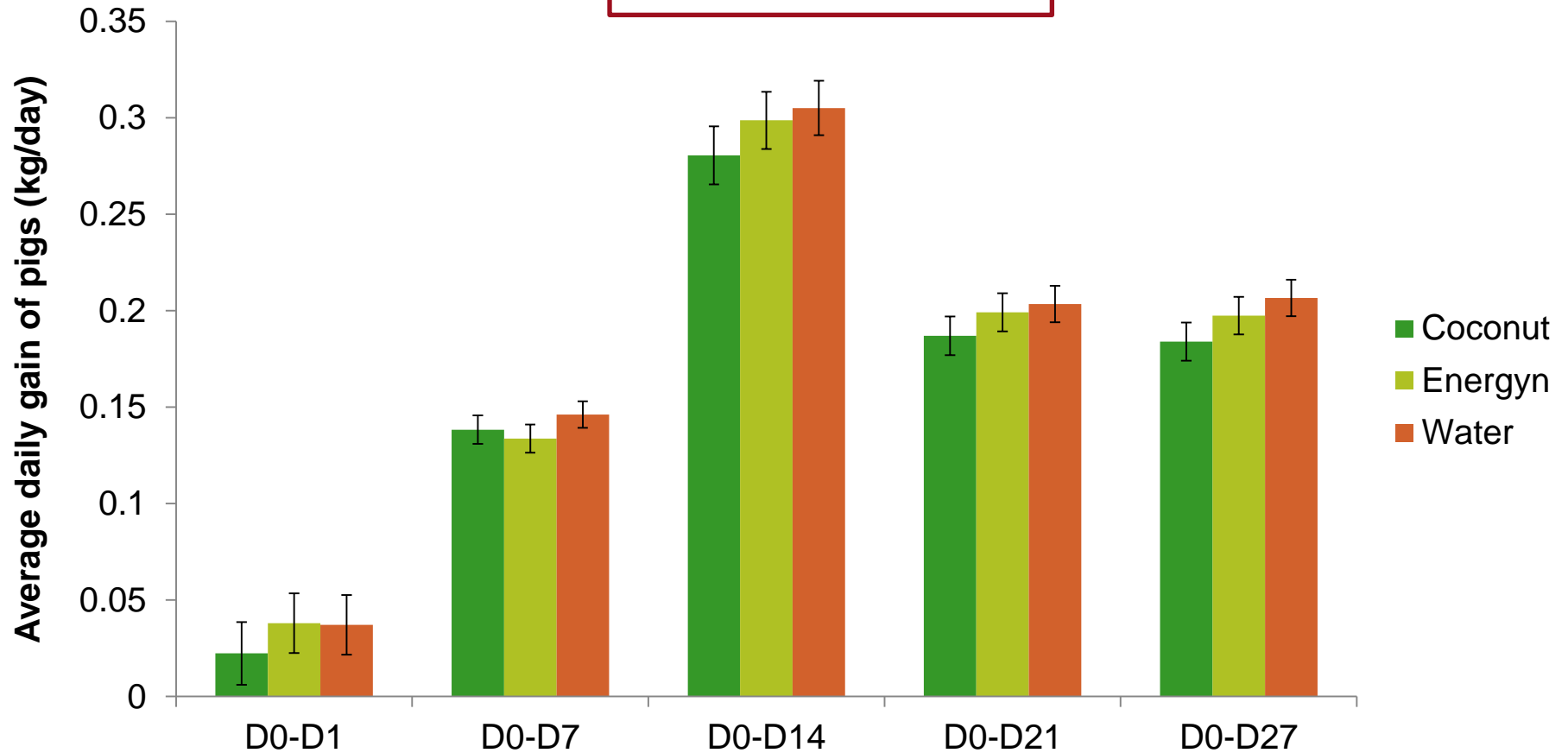


Weights

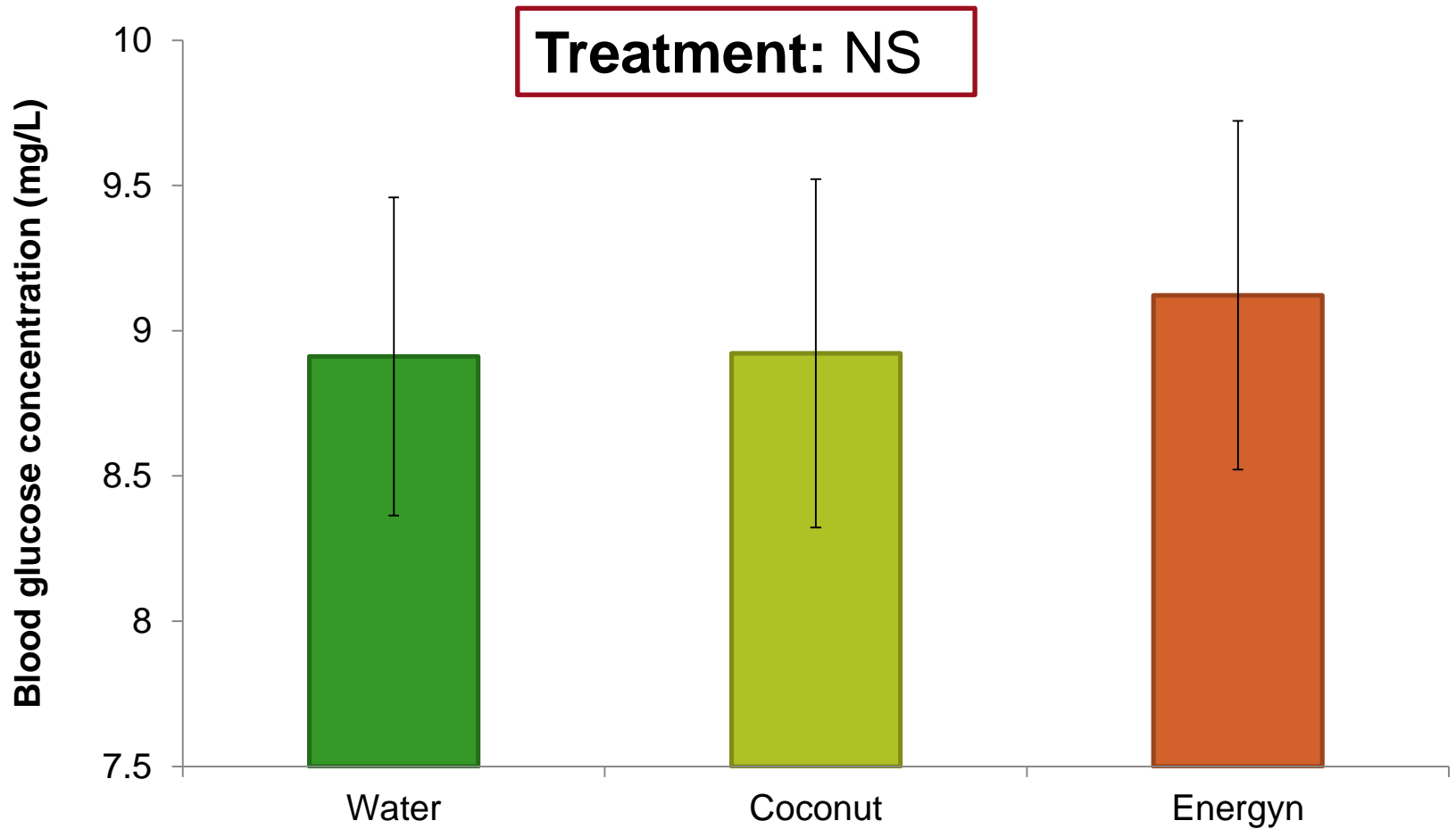


Growth

Treatment: NS



Blood glucose



Discussion

- No effect of supplementation on survival, growth, or blood glucose content
 - Pilot study
 - High health standards piggery
 - 2 ml enough ? $71 - 74 \text{ KJ} = 15\text{h}$ heat production

To be continued...

- Large scale study:
 - Extra treatment: no supplementation
 - Further measures:
 - » Baseline blood glucose content at birth
 - » Colostrum quality of sows
 - » Vitality of piglets
 - » Body temperature
 - » Cognitive abilities after weaning



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