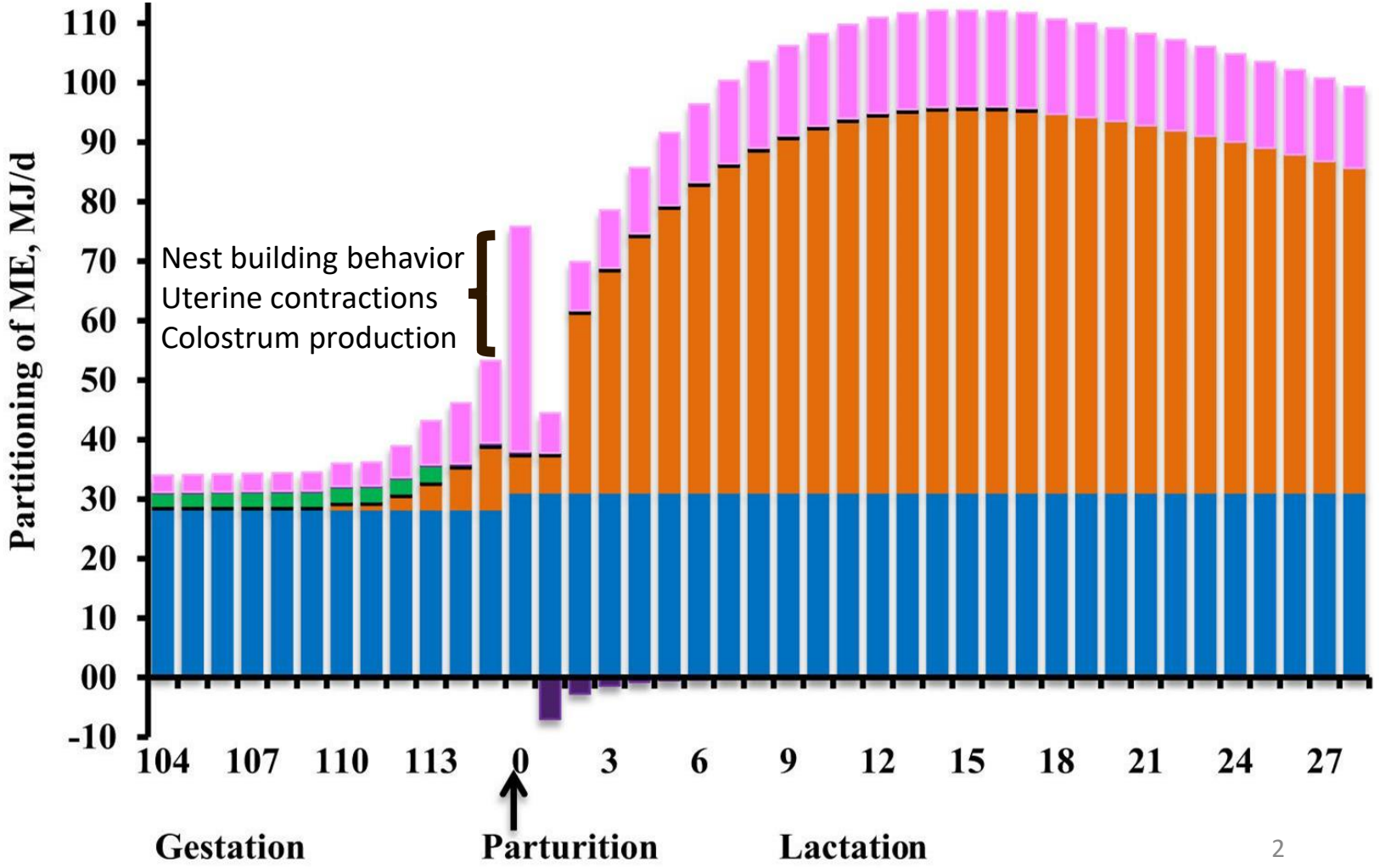
EFFECTS OF SUPPLEMENTING ENERGY AT ONSET OF FARROWING ON FARROWING KINETICS AND PIGLET VITALITY

Rafaella Fernandes Carnevale

Energy and lysine requirements and balances of sows during transition and lactation: A factorial approach ☆

Takele Feyera, Peter Kappel Theil

- Maintance
- Colostrum/milk production
- Mamary growth
- Fetal growth
- Uterine componets
- Heat loss



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Physiology

Peripheral glycemia and farrowing traits in pigs: An observational study

Rafaella F Carnevale [a], Bruno BD Muro [a], Carlos R Pierozan [b], Matheus S Monteiro [c], Diego F Leal [a], André P Poor [c], Laya KS Alves [a], Nadia AC Gomes [a], Caio A Silva [d], Dominiek Maes [e], Geert PJ Janssens [f], Glen W Almond [g], Cesar AP Garbossa [a]

- Evaluate if the peripheral glycemia (measured on ear vein) of sows at the onset of farrowing is related to farrowing traits.
- Identify and quantify factors associated with peripheral glycemia and the interactions with farrowing kinetics.

- Glycemia was assessed with a portable glucometer(Accu-Chek Guide Meter™, Roche Diabetes Care, Inc) in the auricular vein, at the onset of farrowing (IGly) and at the end of farrowing (FGly).

IGly

FGly

Birth of the first piglet

Birth of the last piglet

RESULTS

Final mathematical model of the factors affecting farrowing duration

	Farrowing duration (min)				
			95% coefficient interval		
Item	Estimate	SE	Lower	Upper	P-value
Intercept	569.22	114.53	343.58	794.86	<0.0001
Oxytocin					
No	-42.59	12.56	-67.33	-17.85	0.0018
Yes (ref)	0				
Total born piglets	3.43	1.40	0.68	6.18	0.0079
Parity					
1 (ref)					
2	38.20	16.10	6.51	69.89	0.0130
3, 4, and 5	46.26	14.92	16.88	75.64	0.0029
> 6	21.17	15.94	-10.22	52.57	0.2328
Manual help during farrowing					
No	-33.74	14.41	-62.12	-5.35	0.0282
Yes (ref)	0				
Initial glycemia (mMol/L)	-122.41	41.33	-203.79	-41.02	0.0063

↑1mMol/L = ↓122 minutes

RESULTS

Final mathematical model of the factors affecting initial glycemia

	Initial glycemia (mMol/L)				
			95% coefficient interval		
Item	Estimate	SE	Lower	Upper	P-value
Intercept	4.46	0.12			<0.0001
Fasting period (hour)	-0.018	0.006	-0.031	-0.004	0.01

Effects of timing and size of meals prior to farrowing on sow and litter performance

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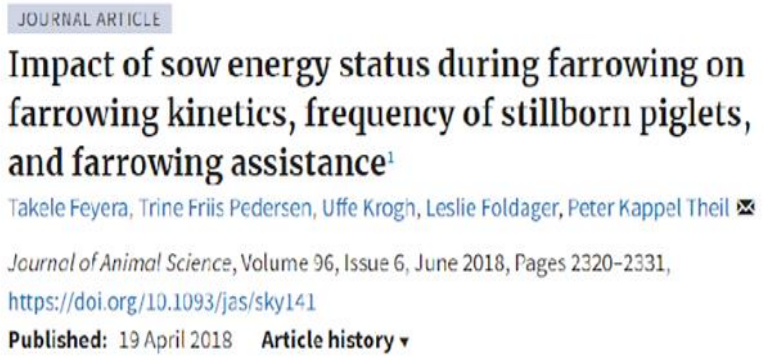

JOURNAL ARTICLE

Impact of sow energy status during farrowing on farrowing kinetics, frequency of stillborn piglets, and farrowing assistance[1]

Takele Feyera, Trine Friis Pedersen, Uffe Krogh, Leslie Foldager, Peter Kappel Theil

Journal of Animal Science, Volume 96, Issue 6, June 2018, Pages 2320–2331, https://doi.org/10.1093/jas/sky141

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CONCLUSIONS

- The portable glucometer is efficient to measure peripheral glycemia
- The adequate peripheral glycemia at onset of parturition is a protective factor against prolonged farrowings.
- Management that exposes sows to prolonged fasting periods should be avoided
- Sows’ glucose metabolism during farrowing may vary based on the energetic status at onset of farrowing.

ELSEVIER

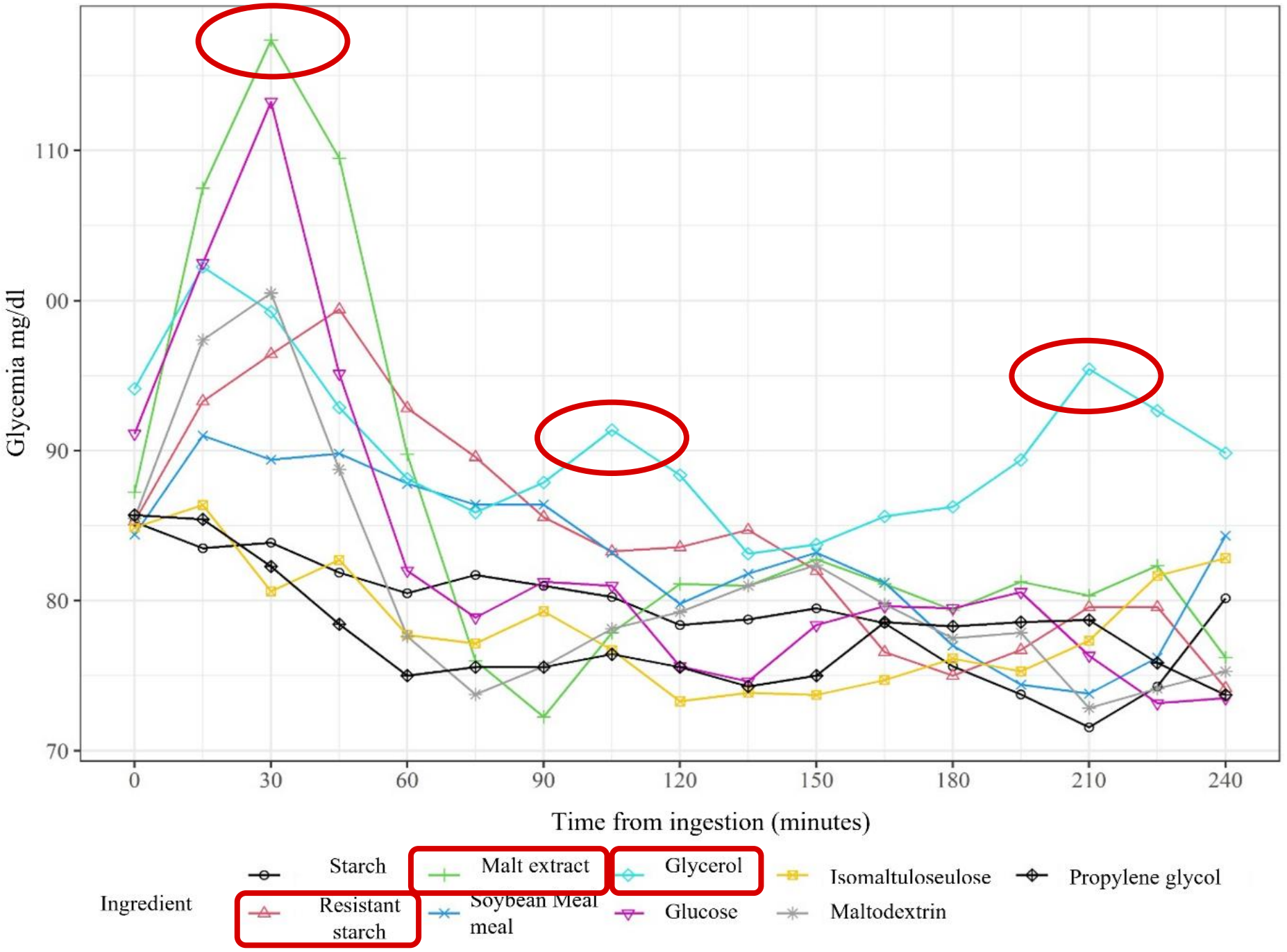
animal

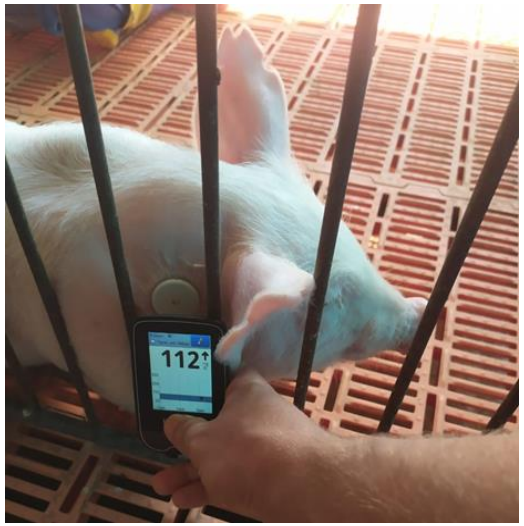
Volume 18, Issue 3, March 2024, 101104

The effects of feeding sows at onset of farrowing supplemental energy (blend of carbohydrates and glycerol) on farrowing kinetics and piglet vitality

R.F. Carnevale [a], B.B.D. Muro [a], D.F. Leal [b], L.K.S. Alves [a], M.S. Monteiro [c], N.A.C. Gomes [a], F.A. Pereira [d], F.N.A. Ferreira [d], C.S.S. Neta [d], T.T.N. Watanabe [e], G.W. Almond [e], C.A.P. Garbossa [a]

- Increase available energy to the sow with an energetic supplement
- Decrease farrowing duration and stillbirth rate
- Improve piglets' vitality


Glycemia mg/dl
110
00
90
80
70
0
30
60
90
120
150
180
210
240
Time from ingestion (minutes)
Ingredient
Starch
Malt extract
Glycerol
Isomaltuloseulose
Propylene glycol
Resistant starch
Soybean Meal meal
Glucose
Maltodextrin


112

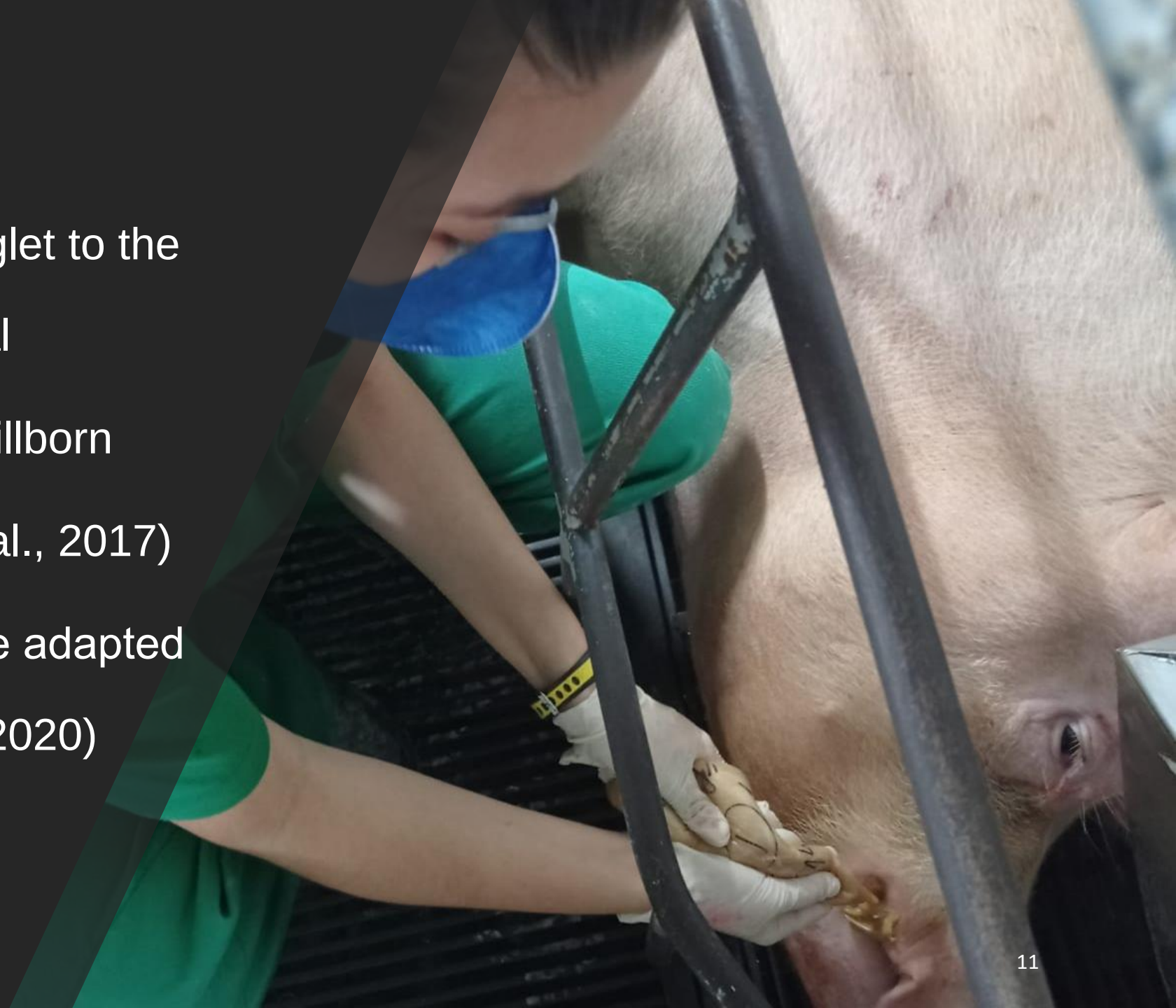
- Sows were housed in farrowing crates with eletronic sows feeder
- 180 PIC Camborough sows
  - SUP: 95 sows
  - CON: 85 sows

  SUP sows were supplemented with the supplement at onset of farrowing (10.5 kcal/kg metabolic weight)

- Energetic supplement constitution:
  - 25% malt extract
  - 25% high-amylose maize starch (~72% of amylose)
  - 50% glycerol
  - Calculated metabolizable energy of 3,899.50 kcal/kg.

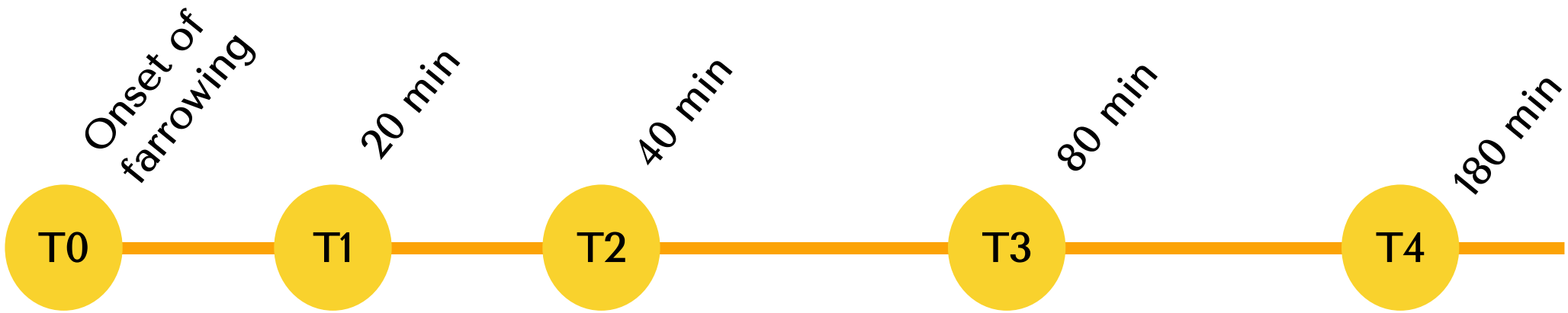
Data collection

- Farrowing duration (first piglet to the last piglet) and birth interval
- Total born, live born and stillborn
- Colostrum intake (Theil et al., 2017)
- Piglets' vitality: Apgar score adapted to swines (Martinez et al., 2020)



MATERIAL AND METHODS

- SOWS' BLOOD GLUCOSE CONCENTRATION



Energy Supplement for the SUP group

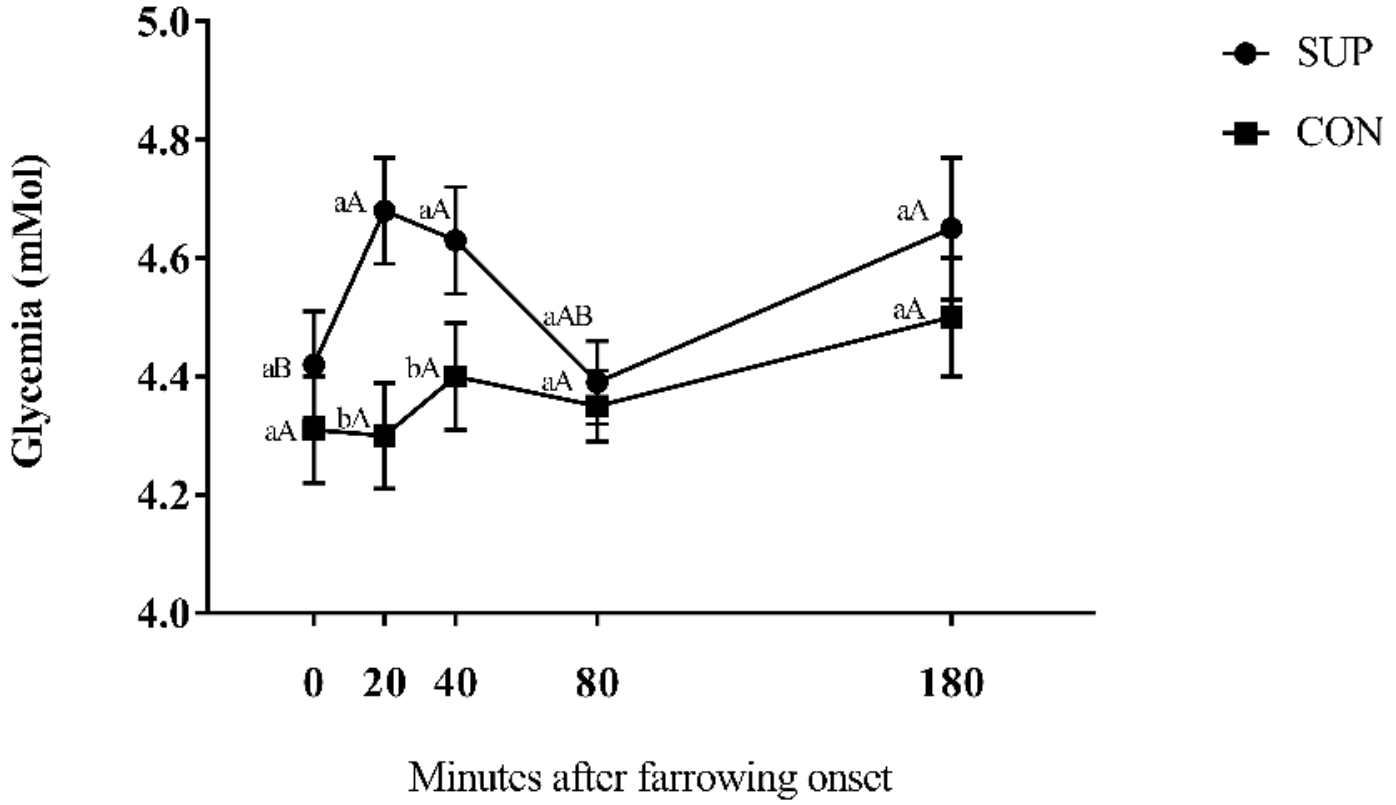
MATERIAL AND METHODS

Numerical score to assess piglet vitality (Martinez et al., 2020) performed in the 1st, 6th, 12th, 17th, and 20th piglets.

Parameter	0	1	2
Respiratory latency	0 ≥ 1 min	16 s to 1 min	≤ 15 s
Heart rate (beats/min)	0 ≤ 110	121–160	≥ 161
Snout skin color	Pale	cianotic	pink
Latency to stand up	≥ 5 min	1–5 minutes	≤ 1 min
Meconium staining	Absent	Less than 50% of the body	More than 50% of the body

RESULTS

Sows' blood glucose concentration



Different upper-case letters indicate statistical difference ($p<0.05$) within group.

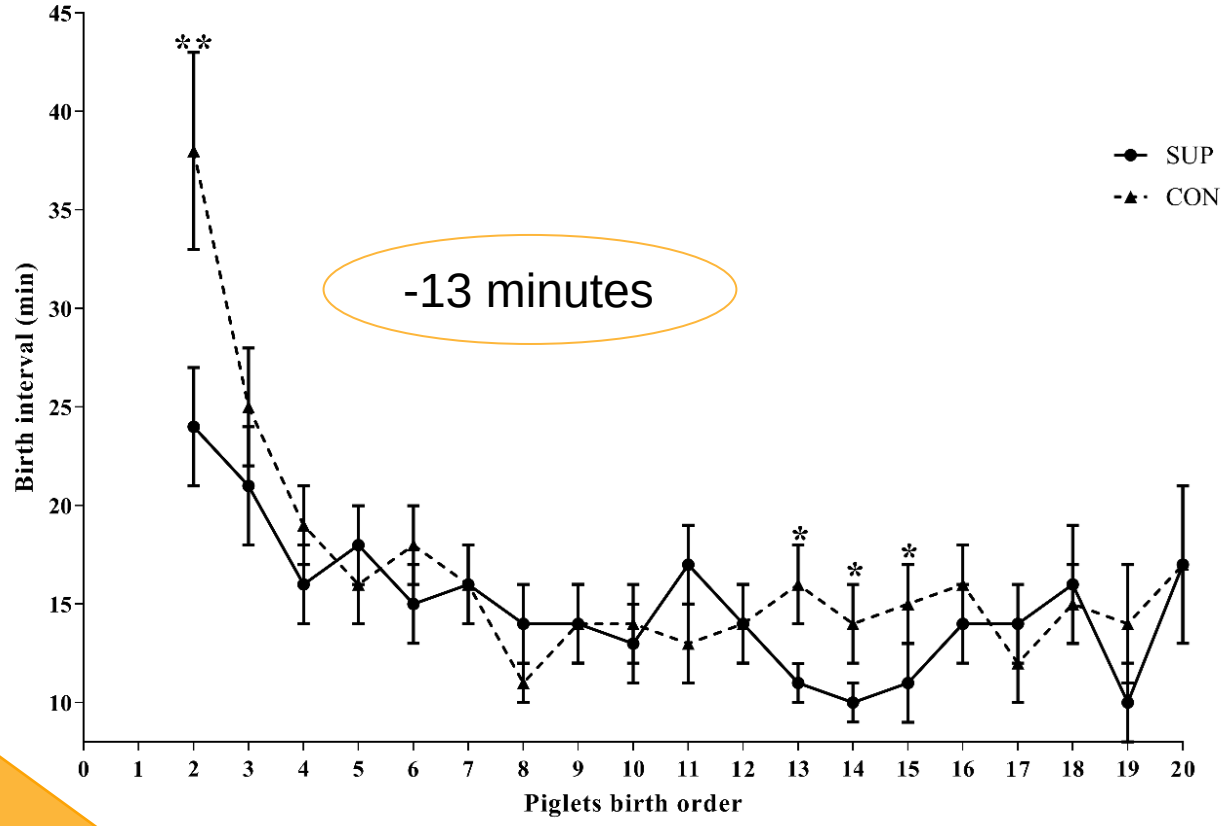
Different lower-case letters indicate statistical difference ($p<0.05$) between groups.

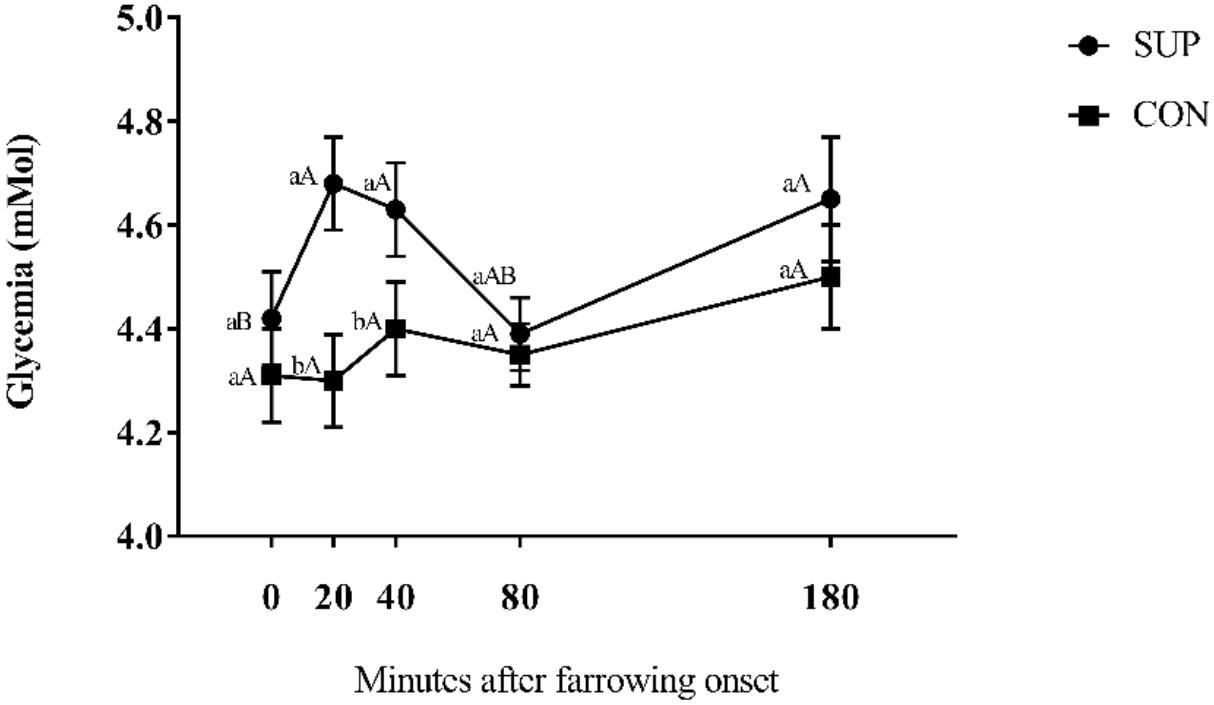
RESULTS

Farrowing outcomes

Iten	Treatment		P- Value
	SUP	CON	
Farrowing Duration (min)	200,0 ± 17,2	220,0 ± 18,5	0,03
Average Birth Interval (min)	12,1 ± 1,01	13,8 ± 1,08	0,02
Total Born	17,4 ± 0,4	17,4 ± 0,3	0,90
Live Born	15,8 ± 0,5	15,3 ± 0,5	0,30
Stillborn (%)	4,3 ± 0,5	5,1 ± 0,6	0,50

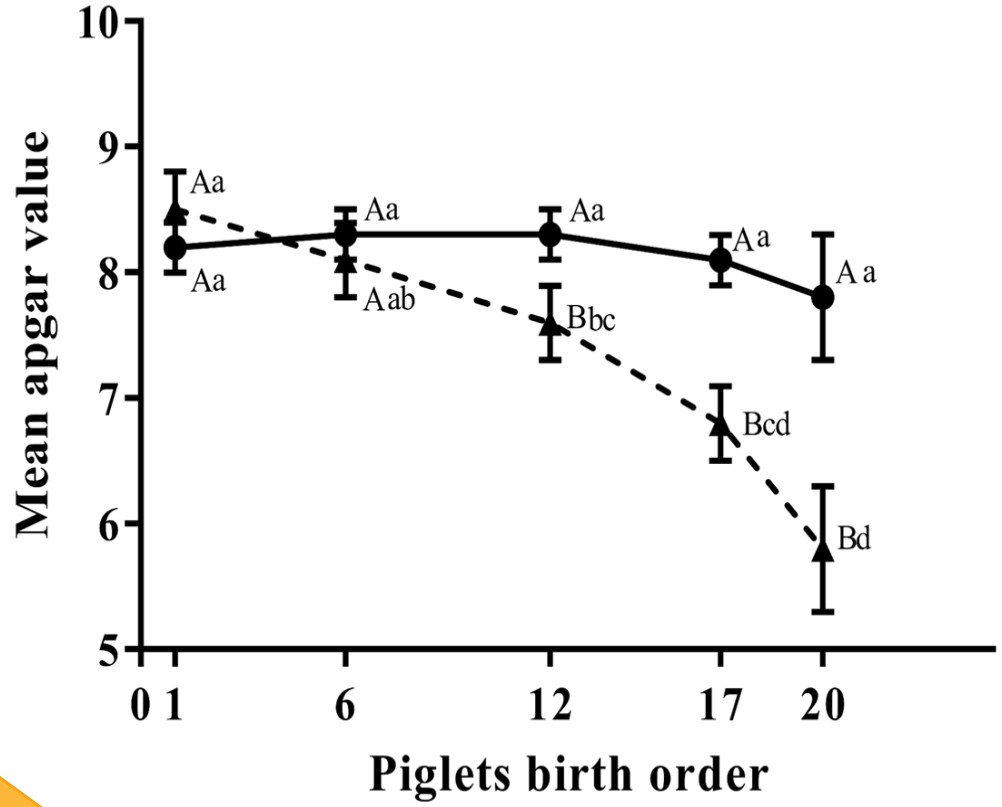
RESULTS

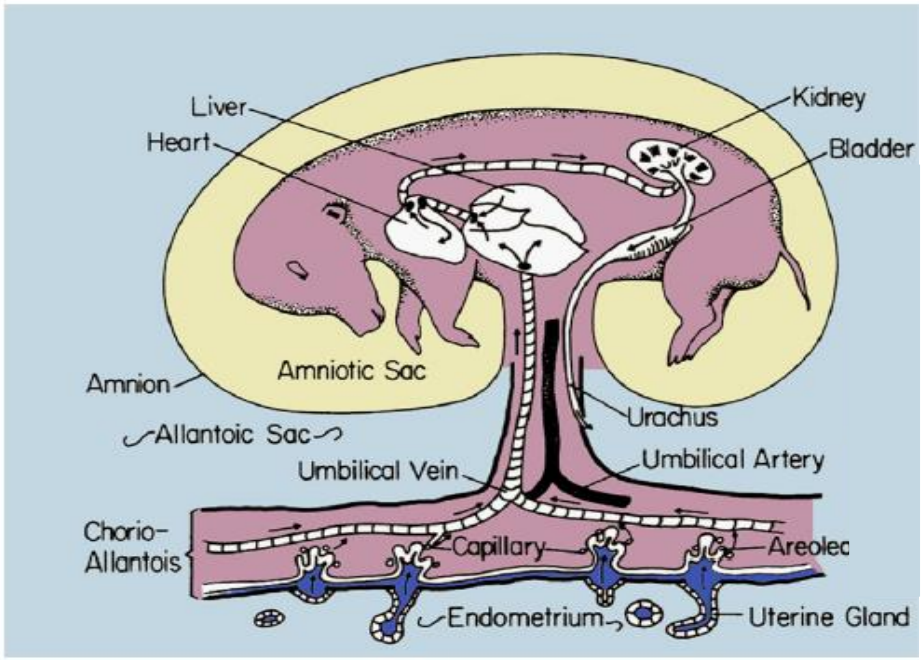

Birth interval (min)
Piglets birth order
SUP
CON
-13 minutes
**
*
*
*


Glycemia (mMol)
Minutes after farrowing onset
SUP
CON
aA
aA
aA
aB
bA
aA
bA
aAB
aA
aA

RESULTS

Mean Apgar values calculated for the 1st, 6th, 12th, 17th, and 20th piglets

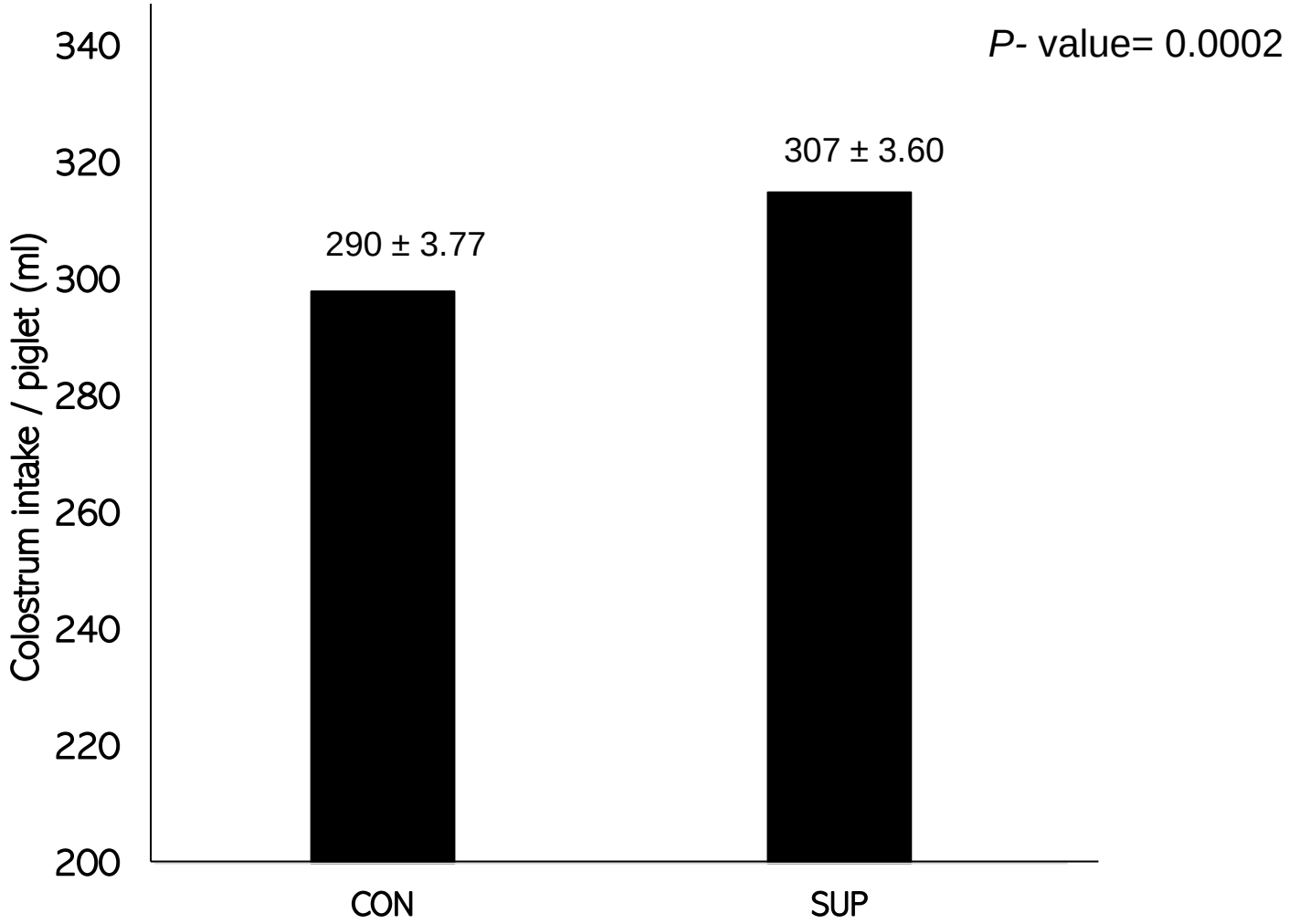




Different lower-case letters indicate statistically difference ($p<0.05$) within group.
Different upper-case letters indicate statistically difference ($p<0.05$) between groups.

RESULTS

Colostrum intake



FINAL CONSIDERATIONS

- Glycemia is key factor influencing farrowing duration
- Nutritional strategies to ensure optimal glycemic levels during farrowing are needed
- Decrease farrowing duration might not be needed in all farms
- Energy supplementation to parturient sows might have other benefits than just decreasing farrowing duration

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