

F2388

WP2 on arterial blood sampling

Project meeting November 18th, 2021

Mogens Larsen (and Lorenzo Hernandez-Castellano), AU-Foulum

STØTTET AF

Mælkeafgiftsfonden

Blood sampling

- Why arterial blood?
- Active Ca/ionised Ca is affected by blood pH (~50% of Ca in blood)
- Significant difference in pH between venous and arterial blood
- Considerations of implanting intercostal arterial catheters
- Tried to go for superficial ear artery

Blood sampling from ear artery



Sampling schedule of arterial blood

Day -12	Calving time	Day +½ (+11 to 18 h)	Day +1½ (+35 to 42 h)	Day +2½ (+59 to 66 h)
Closest Tuesday/Friday	14.00 to 21.59 h	Around 8.00	Around 8.00	Around 8.00
	22.00 to 4.59 h	Around 14.00	Around 14.00	Around 14.00
<i>Added during summer</i>	<i>5.00 to 13.59 h</i>	<i>Around 22.00</i>	<i>Around 22.00</i>	<i>Around 22.00</i>

Number of sampled cows

	Treatment	Day -12	Day ½	Day 1½	Day 2½
Sampled		92	28	28	28
Used	FAROFF	6	6	6	6
	LOWCLO	6	6	6	6
	CLOSUP	6	6	6	6
	OVER	6	5	6	6

Analysis of blood

Fresh whole blood

- Radiometer ABL 90 FLEX



PICO50 syringe



Parameters

Blood gasses:

pH, pCO₂, pO₂

Metabolites:

cGlu, cLac

Elektrolytes:

cCa²⁺, cCl⁻, cK⁺, cNa⁺

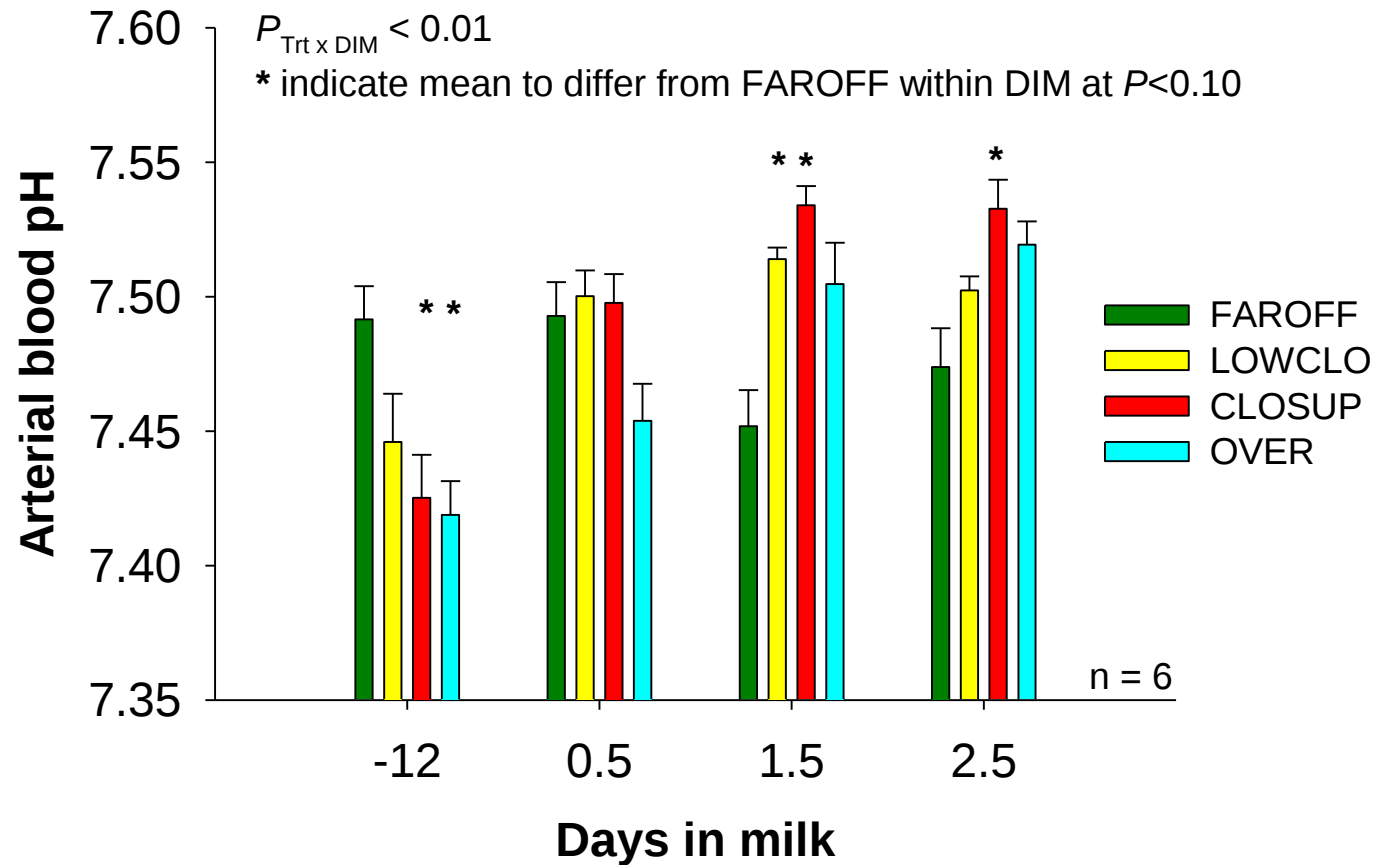
Oximetrics:

FCOHb, ctBil, ctHb, FHbF,
FHHb, FMetHb, sO₂, FO₂Hb

Harvested plasma

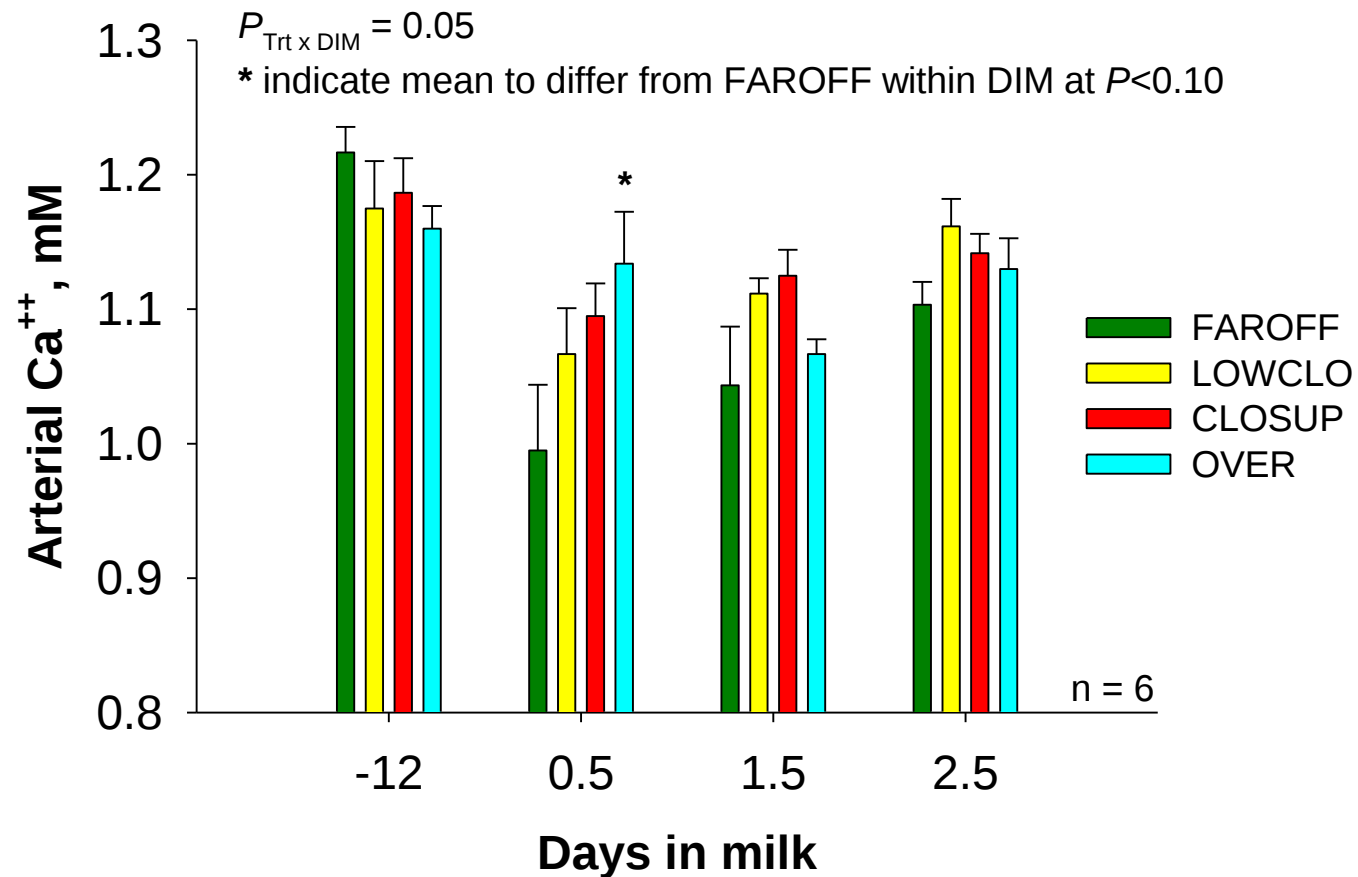
- Advia analyser
 - Glucose, BHBA, NEFA
 - Total Ca, inorg. P, Mg, K
 - Acidic phosphatase
- In progress

pH in arterial blood

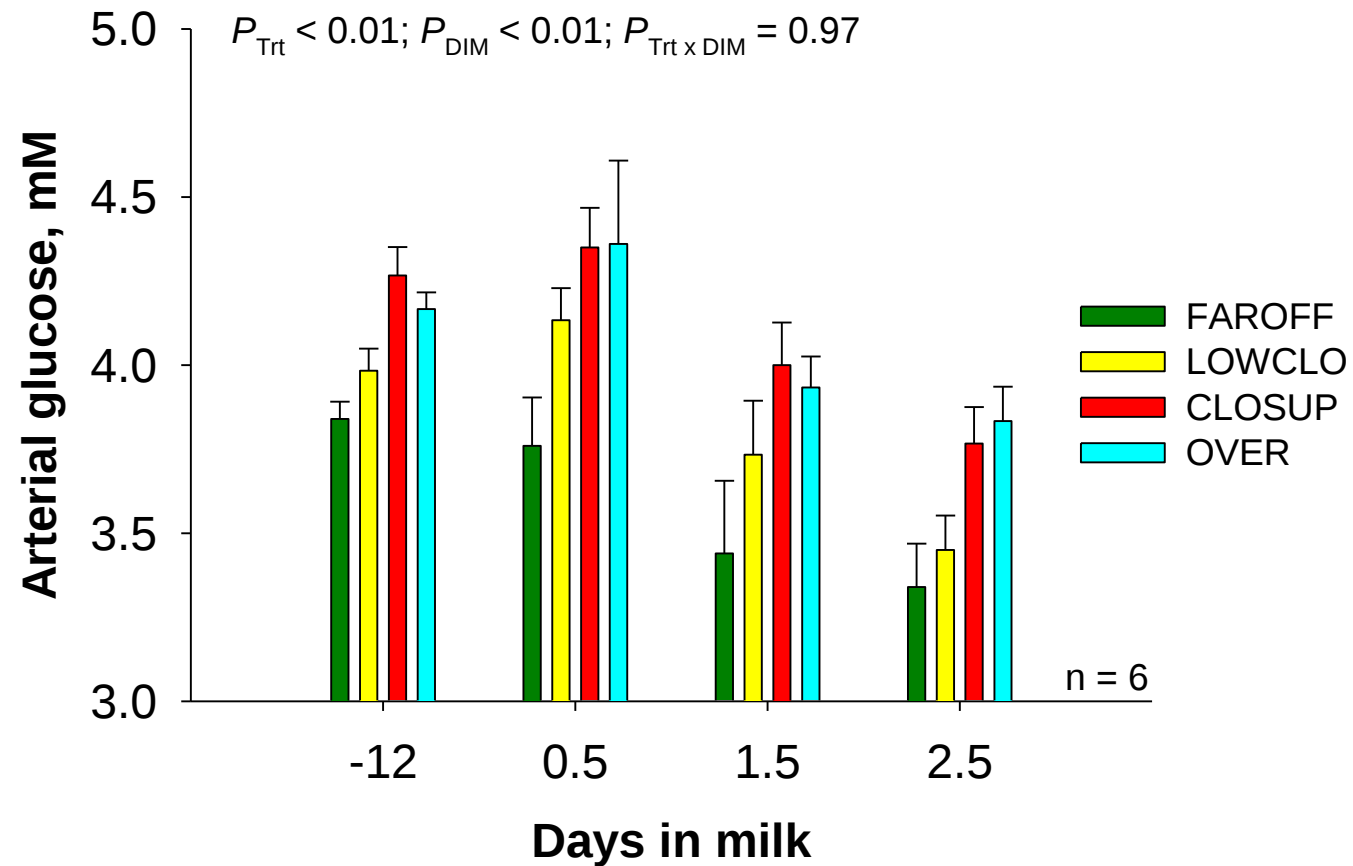


Ionised Ca at actual pH in blood sample

$$cCa^{++}(7,4) = cCa^{++} \times 10^{-0,24(7,4-pH)}$$



Glucose in blood



Urine samples

- Selected samples from dry period are planned for NTX and DPD collagen markers for bone mobilisation
- Elisa kits at Torben Larsen's lab