

STØTTET AF

Mælkeafgiftsfonden

F2388

WP2 on arterial blood sampling

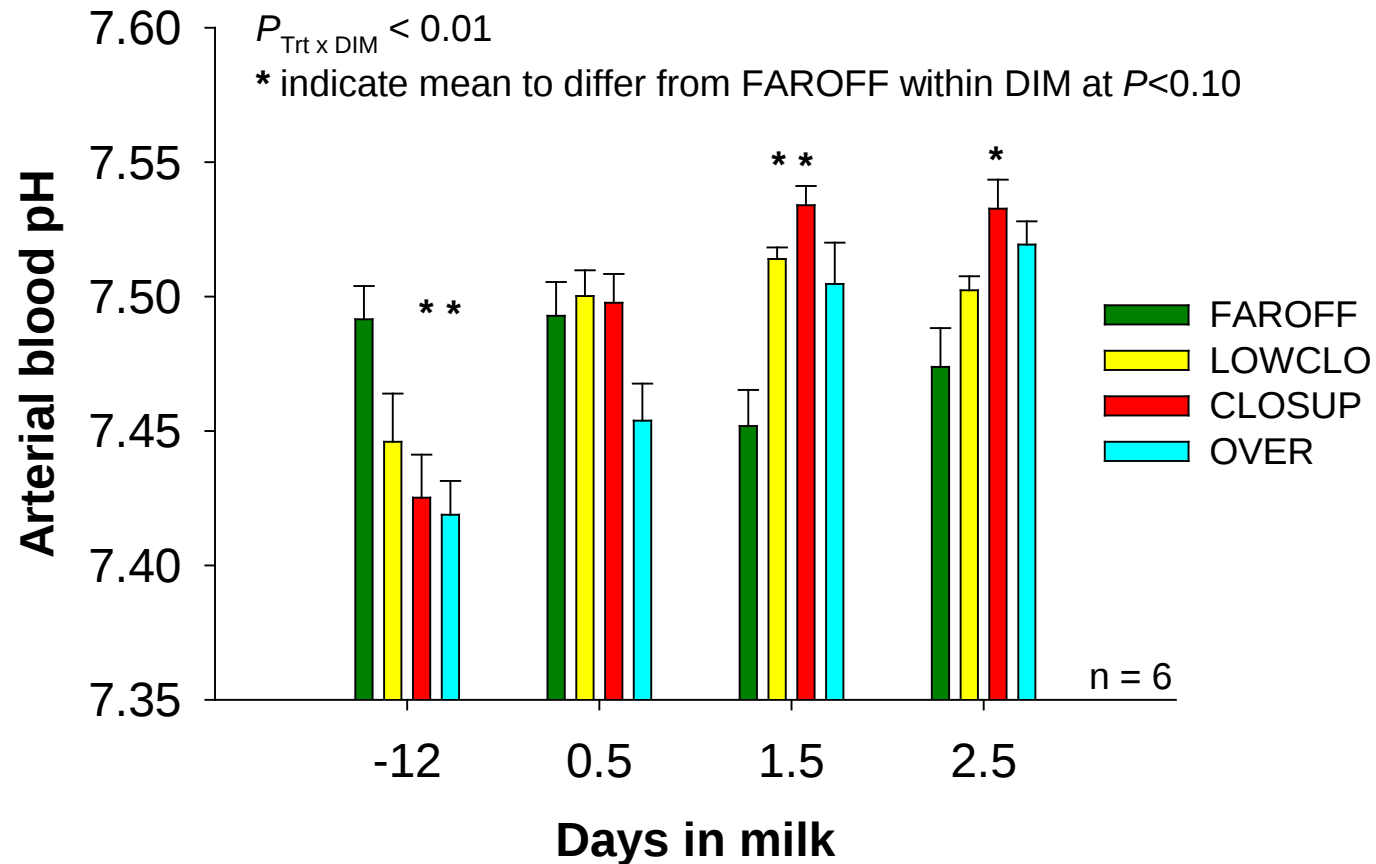
Project meeting November 17th, 2022

Mogens Larsen, AU-Foulum

Blood sampling from ear artery



pH in arterial blood – 2021 experiment



2022 experiment

- Aim to investigate a later shift to lactation diet to maintain lower blood pH for the first 1 to 2 days after parturition
- Diet change from dry-diet to lactation-diet
 - Between 0 and 12 h after parturition
 - Between 24 and 36 h after parturition

Sampling schedule of arterial blood

Calving time	Day +½ (+14 to 25 h)	Day +1½ (+38 to 49 h)
07.00 to 18.59 h	07.00 to 08.00 h	07.00 to 08.00 h
19.00 to 6.59 h	16.00 to 17.00 h	16.00 to 17.00 h

Number of sampled cows

	Treatment	Day ½	Day 1½
Sampled till oct '22		38	37
Used	0 to 12 h shift	14	14
	24 to 36 h shift	12	12
		Aim for 15 per trt	
Exclusion criteria			
- Not sampled both days - Not arterial blood at both days (evaluated by O₂ saturation lower than 97%) - On AAT treatment prepartum			

```

PROC MIXED data=abl covtest;
CLASS cowid RationChange Ration dim ;
MODEL ph = RationChange | Ration | DIM / DDFM=kr HTYPE=2 OUTP=res;
RANDOM cowid;
LSMEANS RationChange RationChange*DIM RationChange*Ration / ADJUST=tukey;
RUN;

```

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⁺

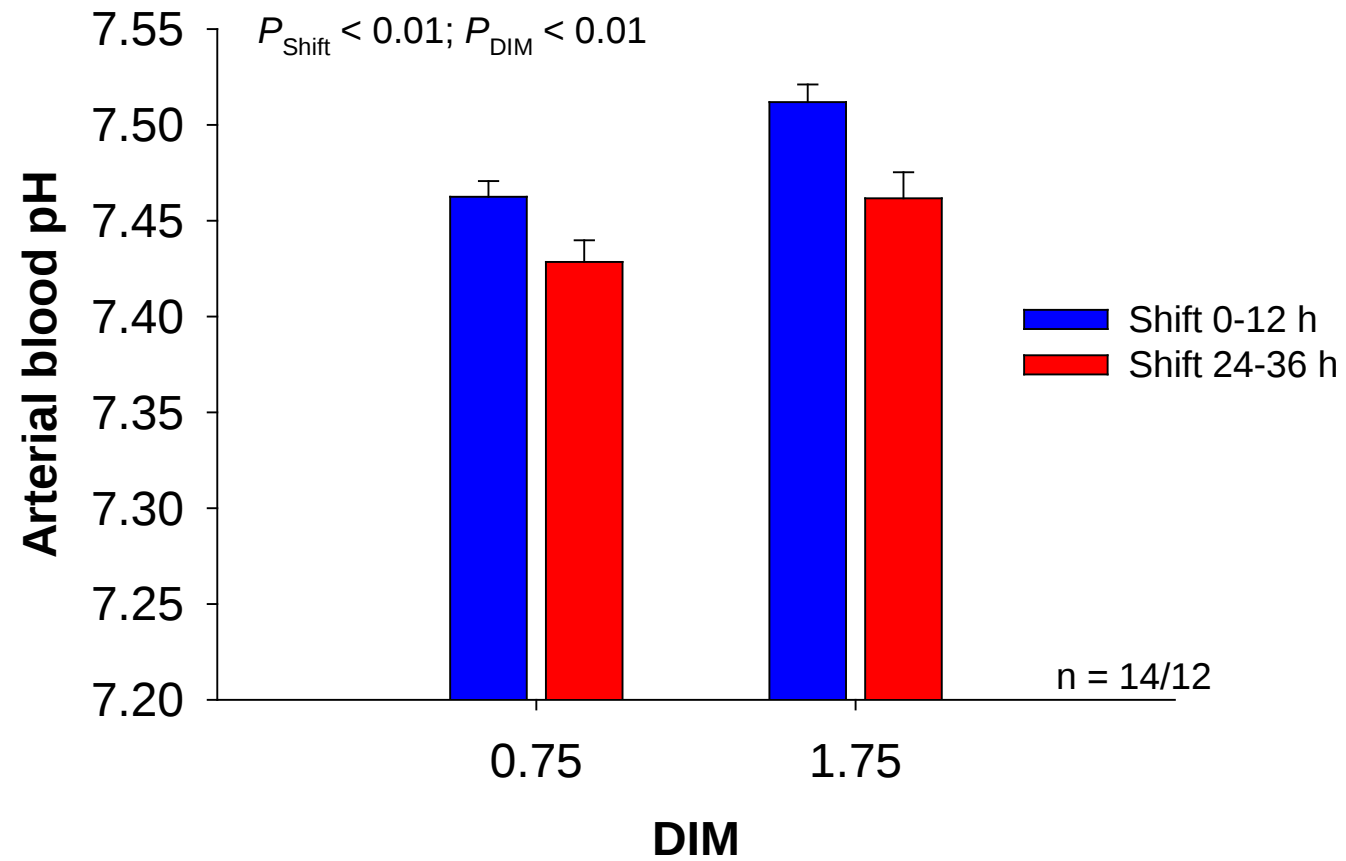
Oximetrics:

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

Harvested plasma

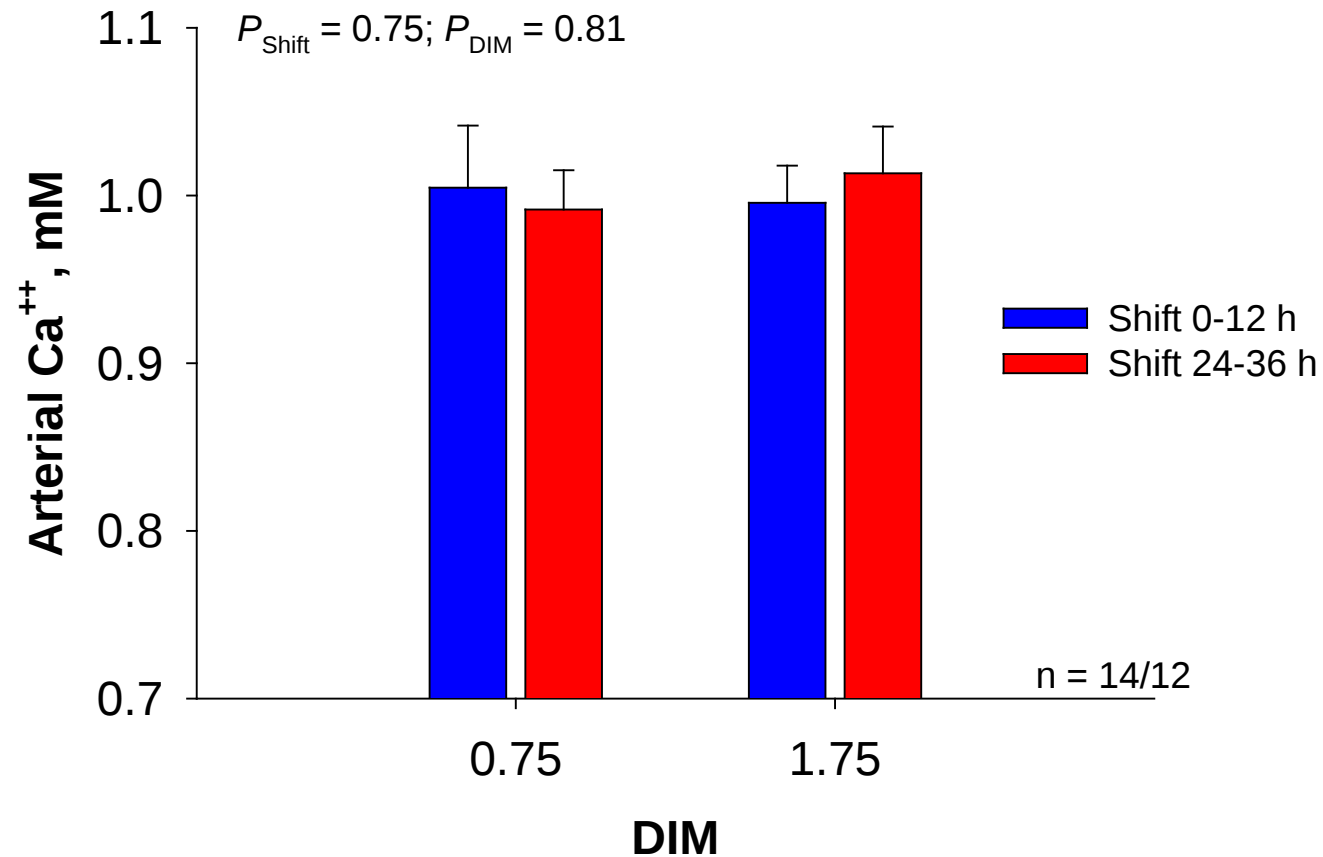
- Advia clinical analyser
 - Glucose, BHBA, NEFA
 - Total Ca, inorg. P, Mg, K
 - Acidic phosphatase
- In progress

pH in arterial blood



Ionised Ca at actual pH in blood sample

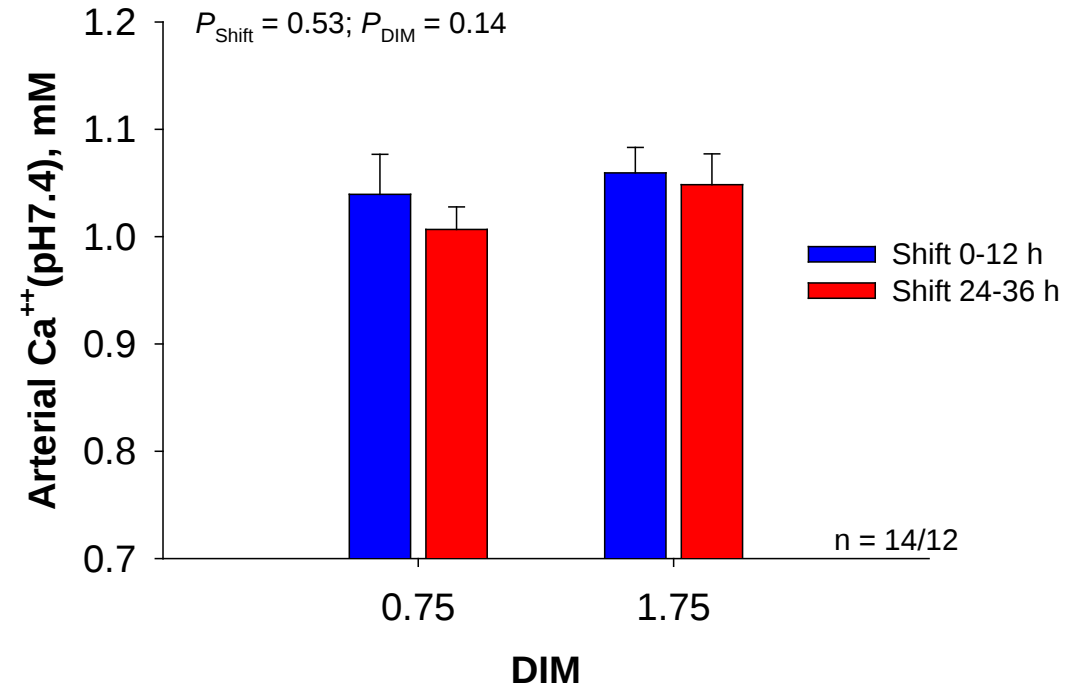
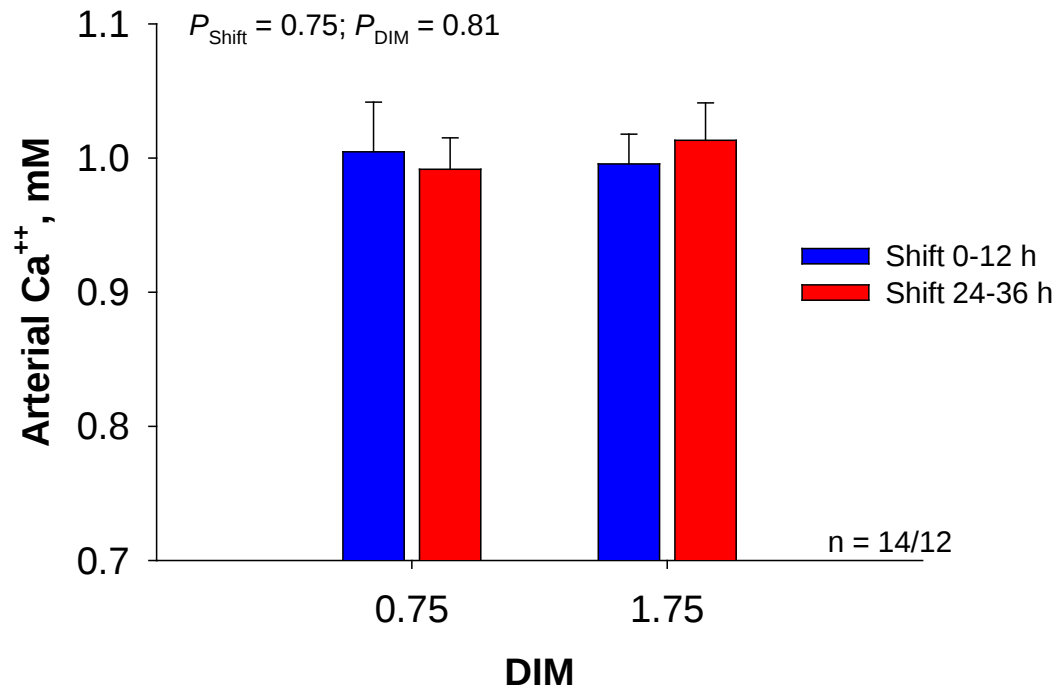
$$c\text{Ca}^{++}(7,4) = c\text{Ca}^{++} \times 10^{-0,24(7,4-\text{pH})}$$



Blood calcium concentrations

Actual

Standardized



Glucose in blood

