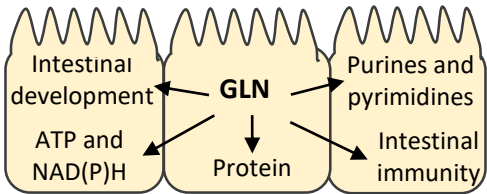


CHANGES IN FREE GLUTAMINE AND GLUTAMATE IN MARE MILK DURING EARLY LACTATION

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IMPORTANCE OF GLN



OBJECTIVES

1. Evaluate changes over time in free Gln and Glu in mare milk
2. Evaluate relationships between foal health and free Gln and Glu in mare milk

MATERIALS & METHODS

- 13 Mares and their foals
- 12 h, 3, 5, 7, 10, 14, 21 d postpartum

Milk Samples

- Samples collected by hand
- Collected during milk let down

Milk Yield

- Measured at 7 and 14 d postpartum
- Muzzled foals for 2 h intervals

Foal Health

- Foal body weights recorded weekly
- Recorded total days with diarrhea

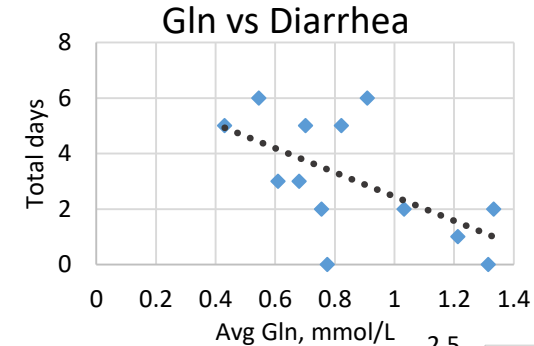
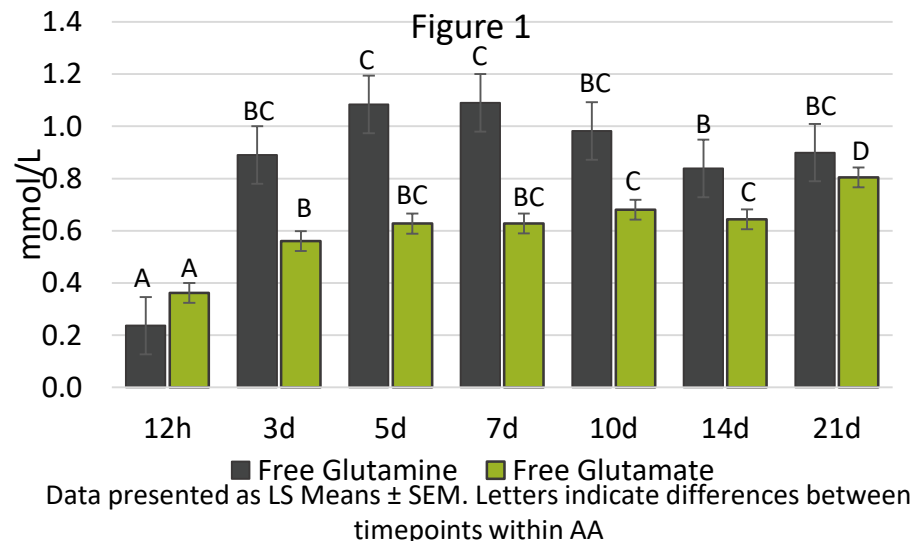
- Fecal scoring system 1-6, ≥ 5 considered diarrhea
- Analyzed using mixed model ANOVA with repeated measures and Pearson's correlation coefficient (SAS 9.4)

METHODS CONT'

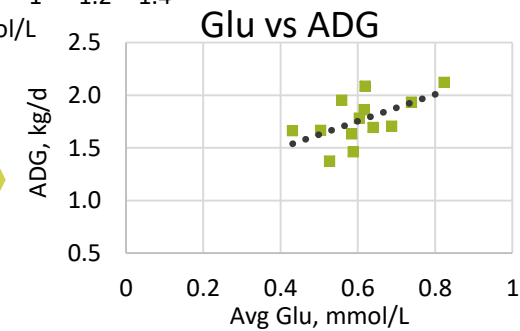
- Fat and protein removed by repeated centrifugation
 - Once for 10 min, 3500 x g, 4 °C
 - Twice for 5 min, 10,000 x g, 22 °C
- Gln and Glu analyzed by Membrane-based glutaminase and glutamate oxidase method (YSI 2700 Analyzer)

RESULTS

- Free Gln and Glu in mare milk changed over time in early lactation ($P < 0.0001$; Figure 1)
- Gln conc. peaked at 5-7 d postpartum whereas Glu conc. continued increasing during 21 d postpartum
- Daily Gln production was similar 7 to 14 d (1.78 g/d; $P > 0.05$), Glu increased 7 to 14 d (1.06 to 1.43 g/d, respectively; $P < 0.05$)



Foal ADG positively related to free Glu avg across sample days
 $P = 0.0384$, $r = 0.578$



CONCLUSIONS & IMPLICATIONS

- Gln increases within the first week postpartum then relatively stable
- Glu continues increasing through the first 3 wk postpartum
- Similar changes are observed in other species
- Milk Gln promotes foal gut health, potentially protecting from diarrhea
- Milk Glu appears important for foal growth
- Potential area for future research