

Parathyroid hormone response to long-term phosphorus supplementation in steers

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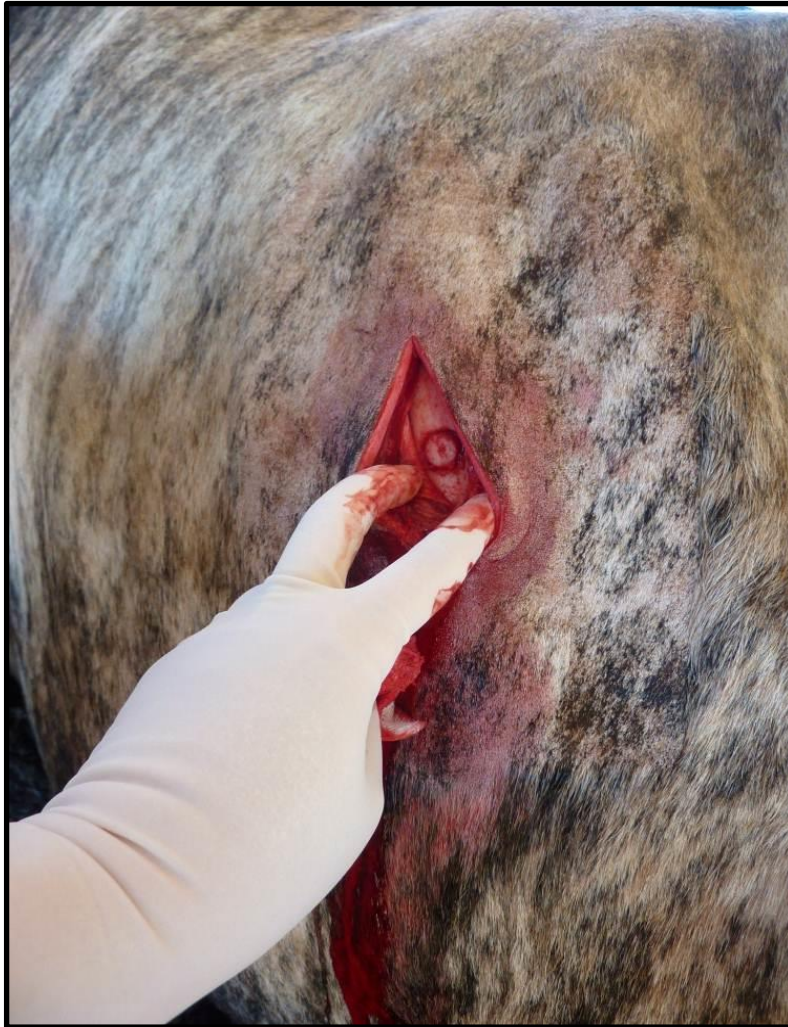
Common indicators of P deficiency/status:

- Plasma inorganic P (PiP)
 - short term, non-robust in range-land conditions
- Faecal P:ME
 - short term, debatable thresholds
- Rib cortical thickness
 - Bone is the major reservoir of P that can be mobilised to meet dietary short-falls in P requirement
 - Bone reserve = long-term P status
 - Biopsy = invasive

To search for a less-invasive marker of “P status”
than a bone biopsy by considering the
endocrinology that underpins bone metabolism

- Thirty *Bos indicus* cross weaner steers, individually fed *ad libitum*
- Five levels of dietary P, 6 steers per level, P1-P5: 0.9, 1.3, 1.8, 2.1 and 2.4g P/kg DM
- After 6 months:
 - Biopsy: 12th rib (ribCT, mm)
 - Plasma: P, Ca, Mg
 - Bone markers: OC, BAP, PYD, tDPD
 - Hormones: uOC, 1,25OHVitD3, PTH
- Relationship between metabolic markers x dietary P level

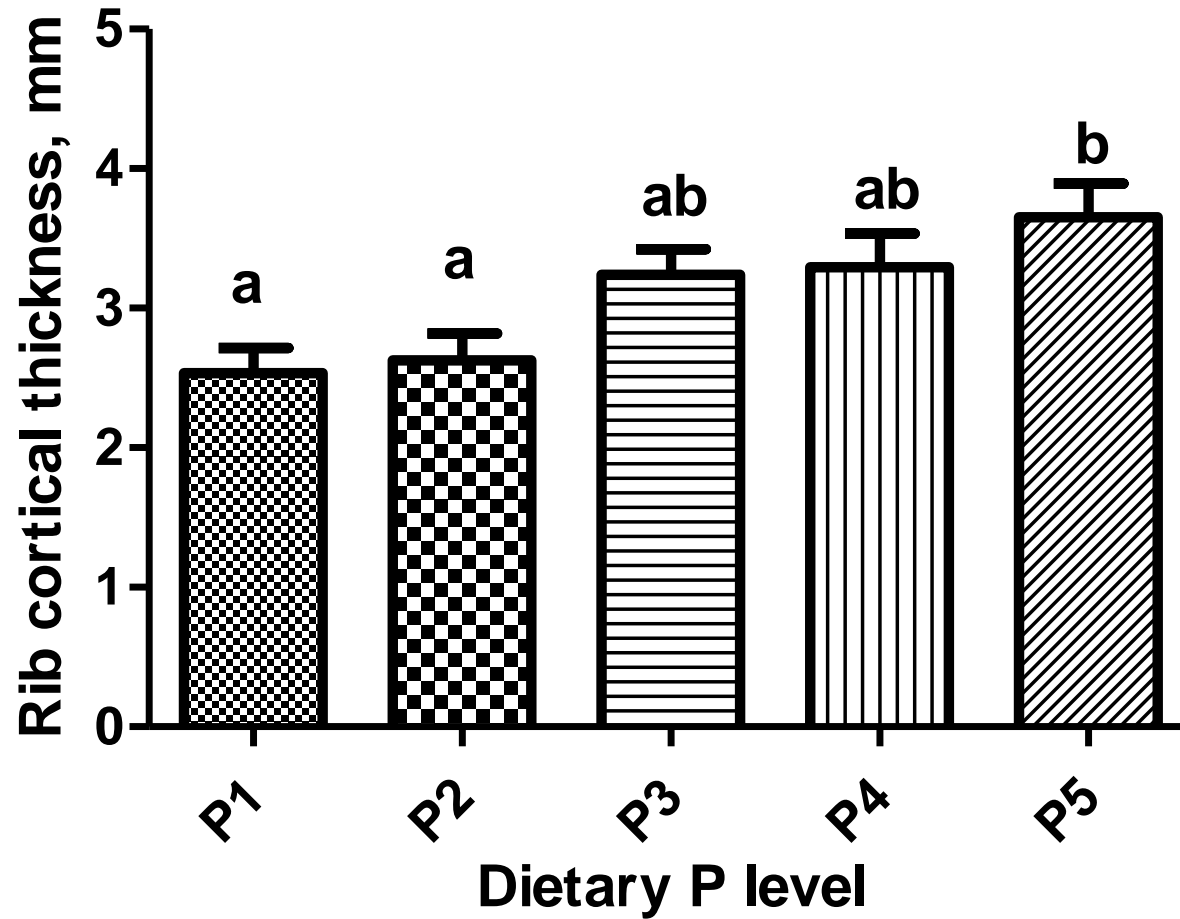
Biopsy of the rib bone for determination of cortical thickness (rib CT)



P1 (left) compared to a P5 steer

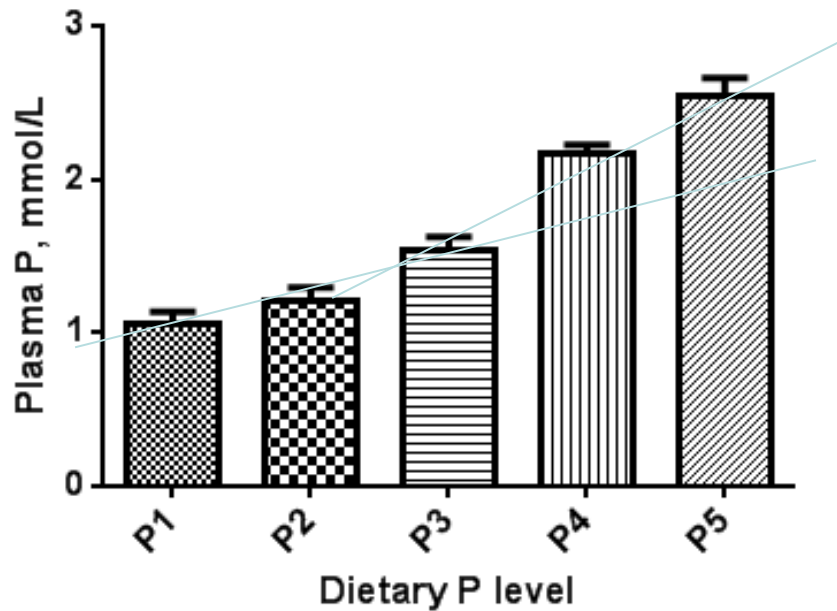


Results and Discussion

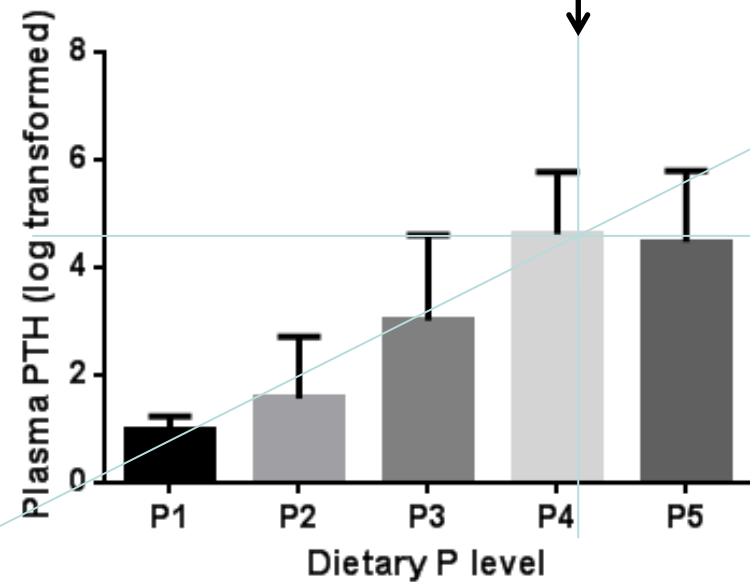


Plasma PiP v. Plasma logPTH

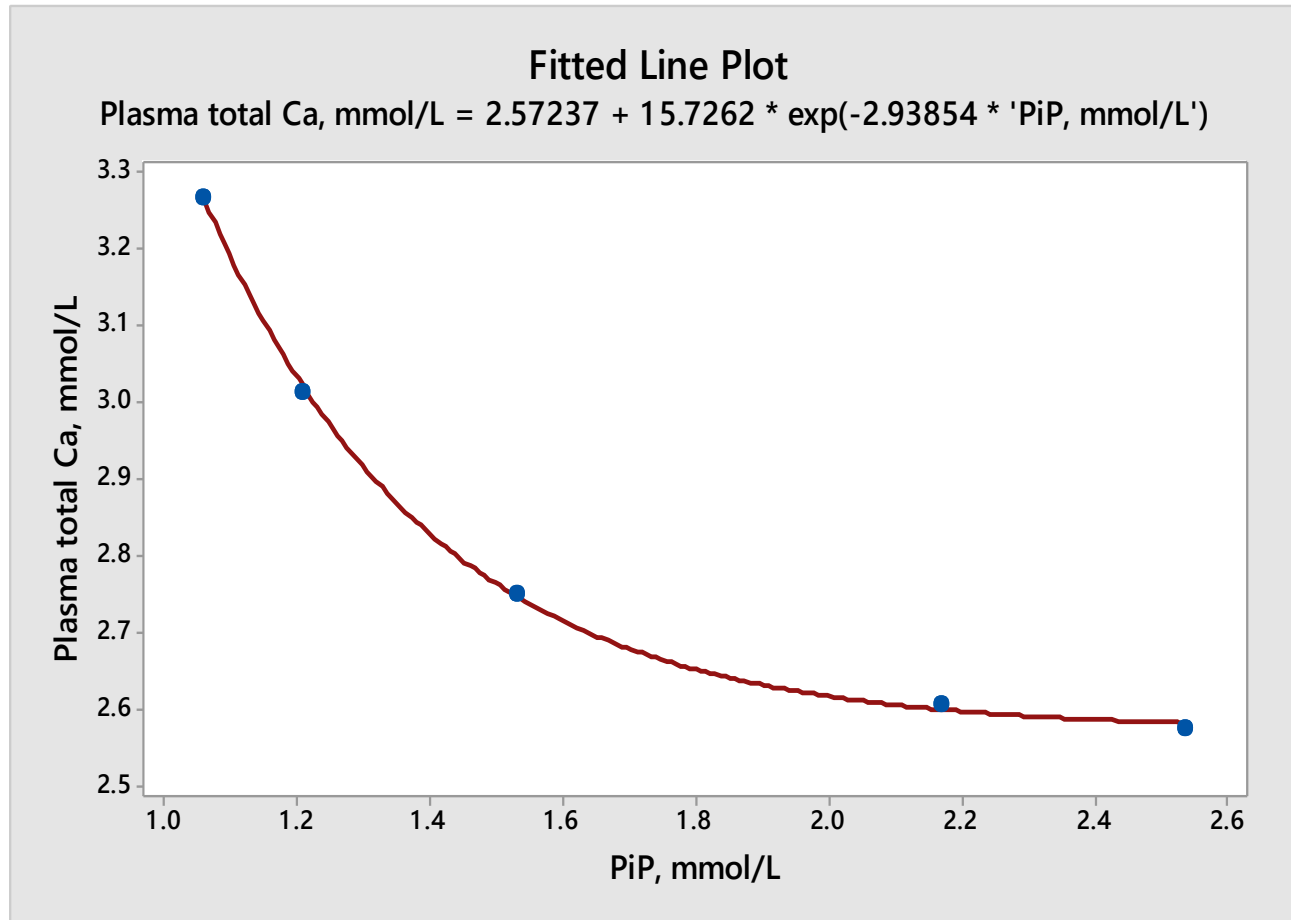
Dietary P x Plasma PiP



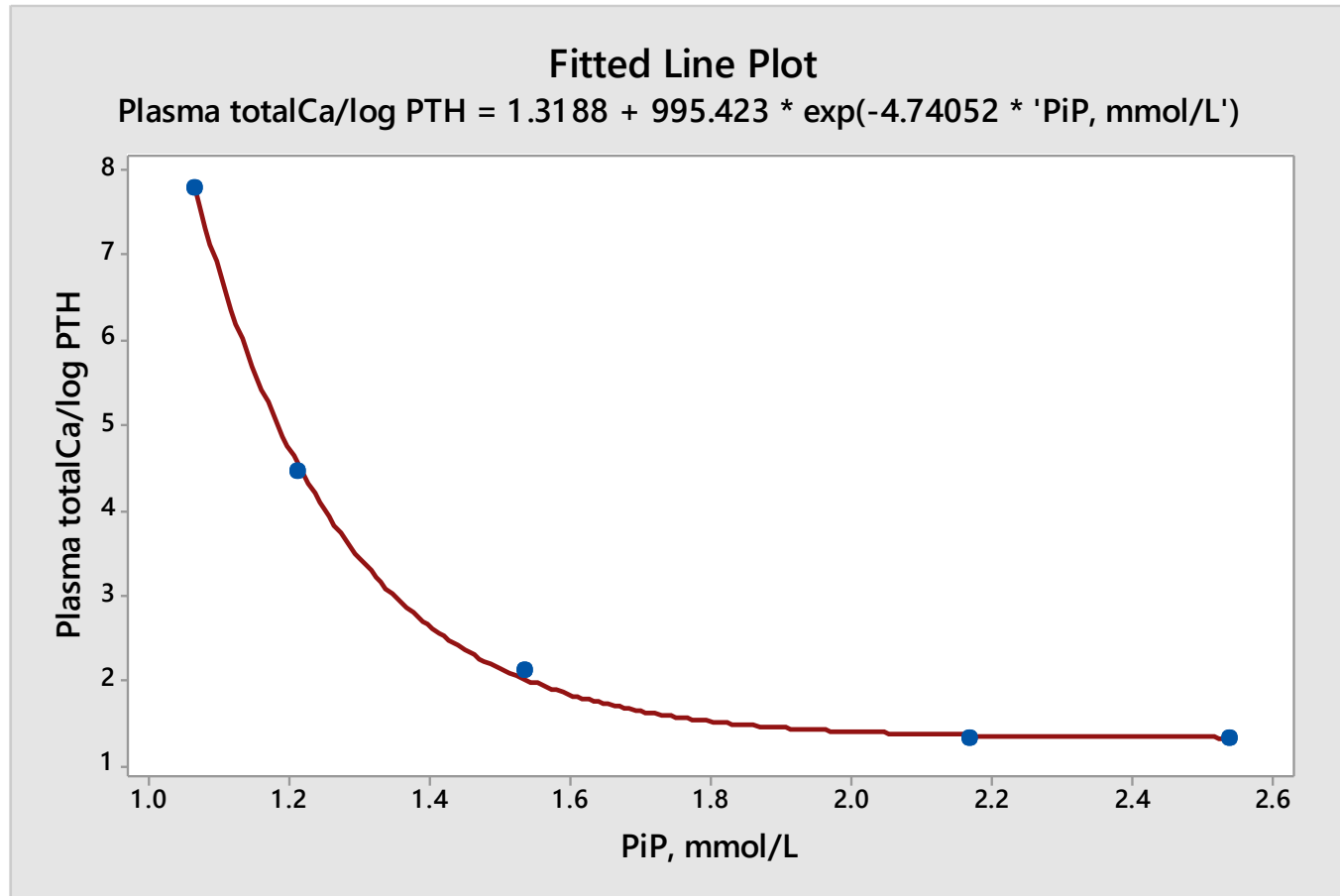
Dietary P x log PTH



Plasma Total Calcium x PiP



Plasma total Ca/logPTH



Plasma PTH and Plasma total Ca warrant further investigation as metabolic predictors of P requirement in steers