

# Impact of low levels of Ca and aP in feed on broiler performance, Ca and P digestibility, bone strength and ash

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## Summary

The trial demonstrated that lowering the Ca and P levels in the feed (when formulating with 1000 FTU/kg OptiPhos® Plus to obtain grower and finisher feed without added MCP) does not have a negative impact on performance, increases Ca and P digestibility, and only has a limited impact on bone ash and bone strength.

## Method

- Number of pens: 18; 24 birds (male chickens) per pen kept till 35 days of age.
- Feed (pelleted at 80°C; starter crumbled):
  - All feed contained OptiPhos® Plus at 1000 FTU/kg (1.76 g/kg aP matrix value) and Hostazym® X at 1500 EPU/kg (on top).
  - STARTER FEED (d 1-10): 22.0 % CP, 1.23 % dig Lys, 2925 kCal/kg ME broiler.
    - Normal Ca and P: 8.5 g/kg Ca; 5.3 g/kg total P; 4.5 g/kg aP
    - Low Ca and P: 6.5 g/kg Ca; 4.8 g/kg total P; 4.0 g/kg aP
  - GROWER FEED (d 10-21): 20.3 % CP, 1.11 % dig Lys, 3000 kCal/kg ME broiler.
    - Normal Ca and P: 7.0 g/kg Ca; 4.3 g/kg total P; 3.6 g/kg aP
    - Low Ca and P: 5.0 g/kg Ca; 3.8 g/kg total P; 3.0 g/kg aP (all MCP removed from the feed)
  - FINISHER FEED (d 21-35): 18.7 % CP, 0.98 % dig Lys, 3050 ME broiler).
    - High Ca and P: 6.0 g/kg Ca; 3.9 g/kg total P; 3.0 g/kg aP
    - Low Ca and P: 4.0 g/kg Ca; 3.7 g/kg total P; 2.9 g/kg aP (all MCP removed from the feed)
- Measurement
  - Technical performance: growth, feed intake and FCR at day 10, day 21 and day 35.
  - At day 21, the tibiae from 3 birds per pen were removed and analysed for bone strength and tibia ash.
  - At day 35, a mixed faecal sample was taken from 5 birds per pen for the determination of Ca and P digestibility.

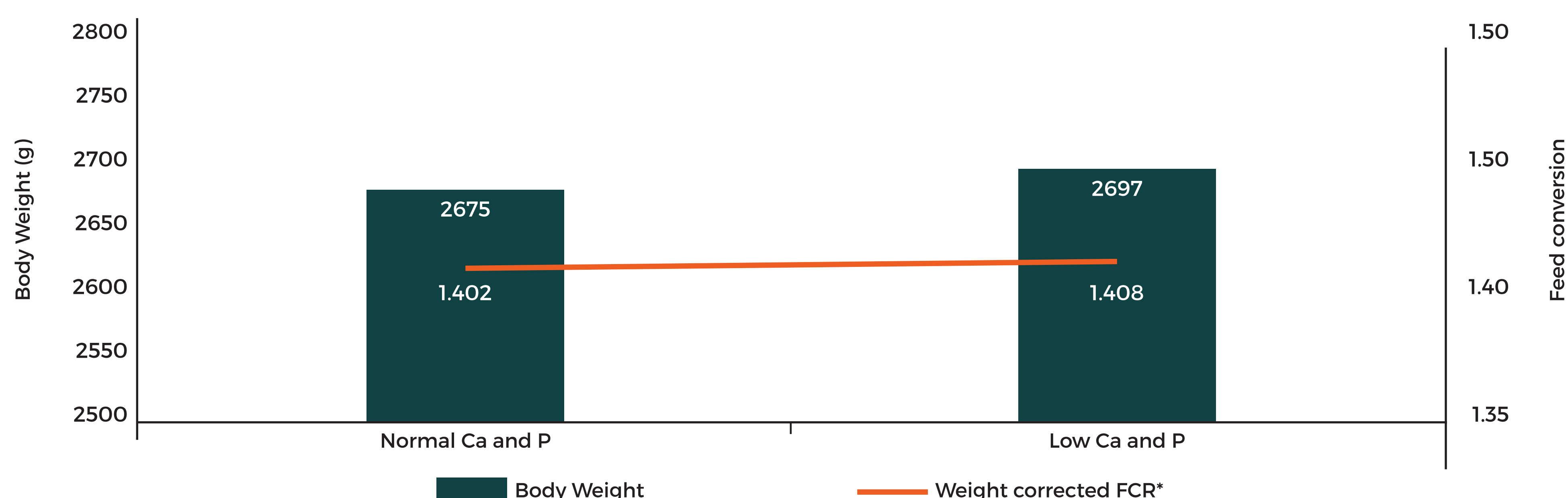
## Results

- Technical performance was very high (close to 2.7 kg bird weight at 35 days with an FCR of 1.4) demonstrating the merits of Hostazym® X and OptiPhos® Plus.
- Lowering the Ca and P level in the feed:
  - Did not have a negative effect on performance; on the contrary it increased end weight with 22 g (Fig. 1).
  - Lowered the bone ash and bone strength slightly, although not significantly (Table 1). The bone ash and strength of the birds on the low Ca and P feed are still above the level known to cause leg disorders.
  - Significantly increased the Ca and P digestibility (Table 1).

**Table 1.** Effect on bone ash and bone strength (day 21) and Ca and P digestibility (day 35)

	Normal Ca and P	Low Ca and P
Bone ash (%)	47.5	46.8
Bone strength (N)	548	532
Ca digestibility	51.7 <sup>a</sup>	66.4 <sup>b</sup>
P digestibility	77.3 <sup>b</sup>	83.2 <sup>a</sup>
Dig Ca intake (g/day)*	0.62 <sup>a</sup>	0.49 <sup>b</sup>
Dig P intake (g/d)*	0.53	0.57

\*Assuming 180 g/day feed intake at day 35



\* Corrected to final BW of 2700 g by assuming 1.6 points increase per 100 g BW

**Figure 1.** Effect on body weight and corrected feed conversion on day 35