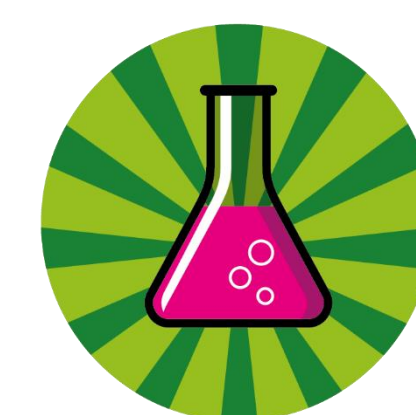


OBJECTIVES OF THE STUDY

Coccidiosis, caused by parasites of the genus *Eimeria*, is known to cause drastic reductions in performance and induce mortality, thereby affecting the overall health status of poultry. The objective of the study was to evaluate the effect of different doses of Zn from a potentiated zinc source and a Cu from a monovalent copper source on the performance, gut morphology, and oxidative status of challenged broilers.



MATERIAL AND METHODS

Animals

- 288 one-day-old male chicks (Ross 308)
- 18 treatments (2 × 3 × 3), 4 reps (pens) and 4 chicks per pen
- 42 days of study

Challenge

Oral inoculation with sporulated oocysts of 4 *Eimeria* species (*Eimeria tenella*, *Eimeria maxima*, *Eimeria acervuline*, and *Eimeria necatrix*) on day 15 of the study for 144 broilers

Dietary treatments

- 2 groups for health status: challenged or unchallenged
- 9 experimental diets were tested:
 - 3 doses of Cu (0, 15 or 150 ppm) × 3 doses of Zn (0, 80 or 160 ppm)
- Cu source - monovalent copper (CoRouge®)
- Zn source - potentiated zinc (HiZox®)

Measurements

Evaluation at the end of the experiment (d42)

- Growth performance: weight gain, feed intake, and feed conversion ratio (FCR)
- Intestinal morphology
- Oocyst excretion
- Oxidative status

Statistical analysis

Statistical differences were considered significant at P<0.05.



RESULTS

The coccidiosis challenge had a negative impact on live weight and FCR, along with reduced villi height and crypt depth compared to broilers not challenged.

Table 1. Effect of coccidiosis challenge on growth performance and intestinal morphology of 42d old broilers

	Live weight (g)	FCR	Villi height (µm)	Crypt depth (µm)
Challenged	2546.84	1.62	1277.25	98.37
Unchallenged	2731.62	1.55	1389.47	108.9
P-value	< 0.01	< 0.01	< 0.01	< 0.01

Regardless the challenge, broilers fed the highest doses of Cu and Zn presented higher live weight compared broilers fed lower doses of Cu and Zn. Increasing the dose of both monovalent Cu and potentiated Zn increased crypt depth and villi height/ crypt depth ratio (V/C ratio), with a significant interaction Cu x Zn.

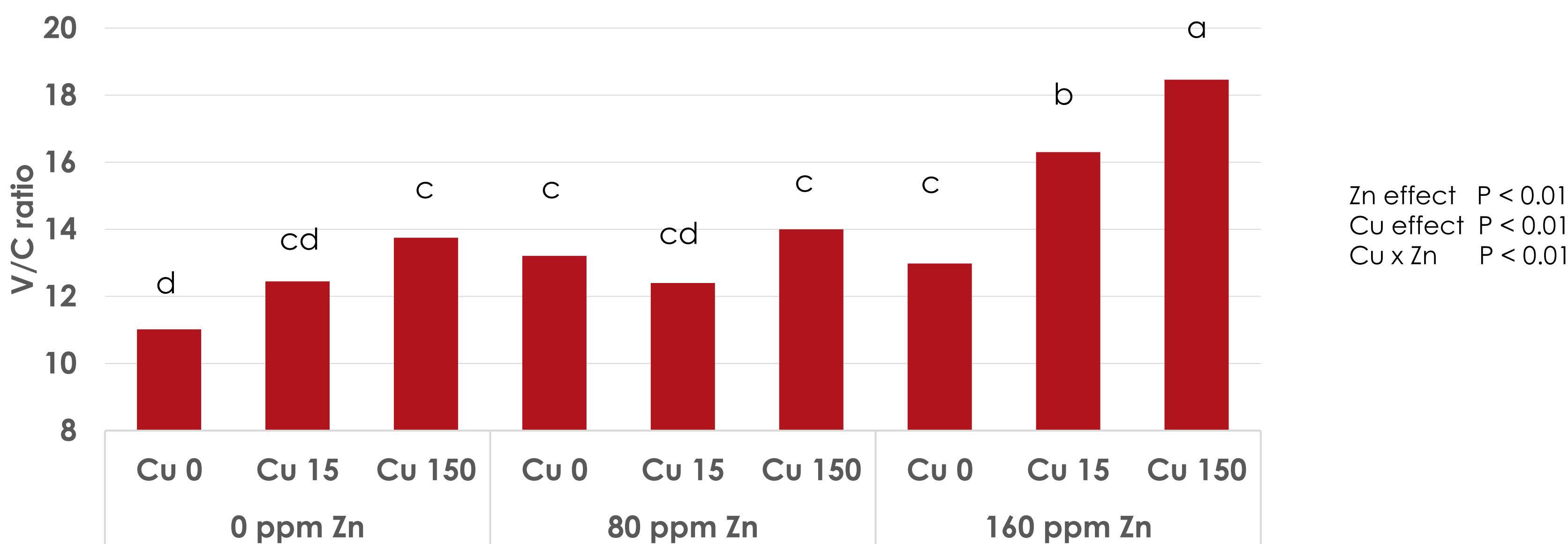


Figure 1. Effect of Cu and Zn on villi height/crypt depth ratio

Oocysts per gram of feces decreased significantly with the increase of zinc and copper in the diet, with a significant interaction Cu x Zn.

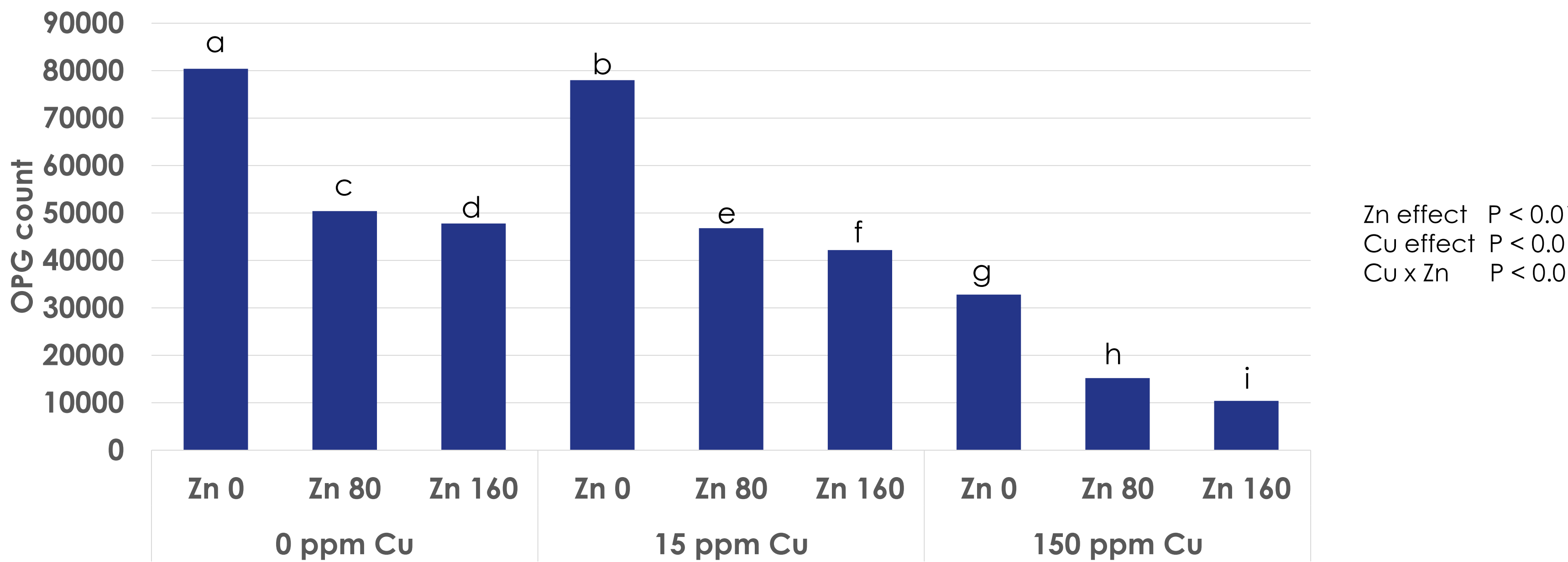


Figure 2. Effect of Cu and Zn on oocysts excretion

The oxidative status was not significantly affected by the treatments.

CONCLUSION

Increasing dietary levels of Zn and Cu from potentiated zinc and monovalent copper source may mitigate the negative effect of coccidiosis challenge on broilers.