



Zinpro Performance Minerals Improve Intestinal and Bone Integrity and Productive Performance in Laying Hens

Study Objective



Evaluate the effect of supplemental Zinpro Performance Minerals (ZPM) on intestinal histology, productive performance, and bone strength of laying hens.

Study Duration



20 weeks

Animals



400 White Lohmann laying hens, 78 wk old

Experimental Procedures

Completely randomized design, with 4 treatments, 10 replicates per treatment and 10 hens per replicate.

Location



Federal Rural University of Pernambuco, Caruaru, PE, Brazil

Treatments

Treatment	Zinc		Manganese		Copper		Iron		Selenium		Iodine
	ZnO	ZnAA	MnO	MnAA	CuSO ₄	CuAA	FeSO ₄	FeAA	Na ₂ O ₃ Se	Zn-Se-Met	Ca(IO ₃) ₂
IM ^a	60	-	60	-	7	-	40	-	0.2	-	2.0
AACM-70 ^b	-	42	-	42	-	4.9	-	28	-	0.14	1.4
AACM-50 ^c	-	30	-	30	-	3.5	-	20	-	0.10	1.0
AACM-40 ^d	-	24	-	24	-	2.8	-	16	-	0.08	0.8

^a IM: 60 ppm Zn, 60 ppm Mn, 7 ppm Cu, 40 ppm Fe, 0.2 ppm Se, and 2.0 ppm I, all from inorganic sources

^b AACM-70: 70% of IM supplementation is replaced by amino acid complexed minerals

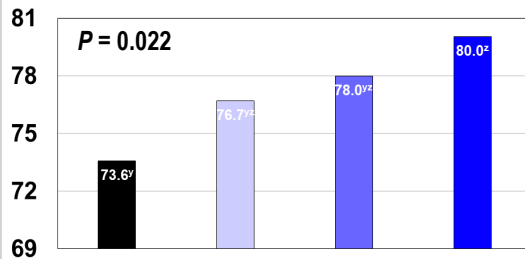
^c AACM-50: 50% of IM supplementation is replaced by amino acid complexed minerals

^d AACM-40: 40% of IM supplementation is replaced by amino acid complexed minerals

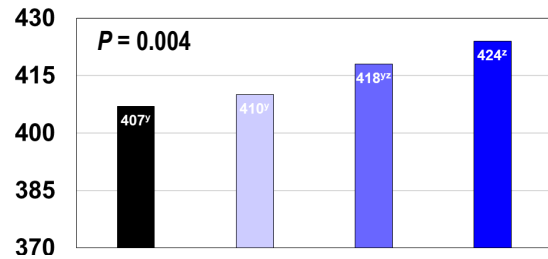
Results

Replacing inorganic trace minerals with AACM resulted in higher egg production rate and higher eggshell thickness compared to the IM group, $P < 0.05$.

ZPM Improve Egg Production, %



ZPM Improve Eggshell Thickness, µm



■ IM ■ AACM-70 ■ AACM-50 ■ AACM-40

ROI Based on Egg Production Percentage

ROI calculated for 100 hens consuming 104 g/d/hen - egg price US \$0.05

	IM	AACM-70	AACM-50	AACM-40
Avg Egg Production (%)	73.58	76.70	77.98	80.04
Diff to IM (eggs/100 hens)		3.12	4.40	6.46
Saleable Eggs Diff to IM - US\$		0.156	0.220	0.323
Cost Increase to Feed ZPM - US\$		0.054	0.038	0.031
ROI		2.9:1	5.7:1	10.5:1

Conclusion

Total replacement of inorganic trace minerals by reduced levels of ZPM improves production and egg quality parameters of White Lohmann laying hens with ROI improvements up to 10.5 to 1 for AACM-40 over IM.





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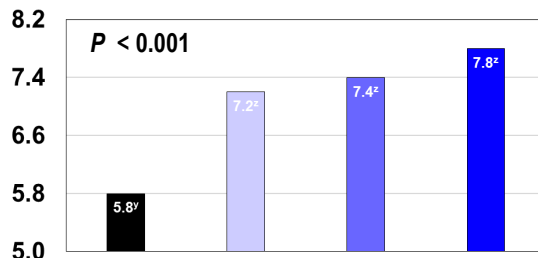
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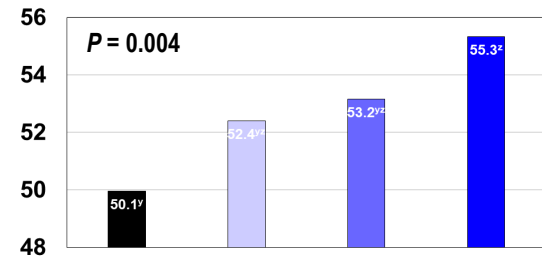
Results

Replacing inorganic trace minerals with AACM resulted in improved villus to crypt ratio, egg mass, FCR per egg mass, and tibial densitometry compared to the IM group, $P < 0.05$.

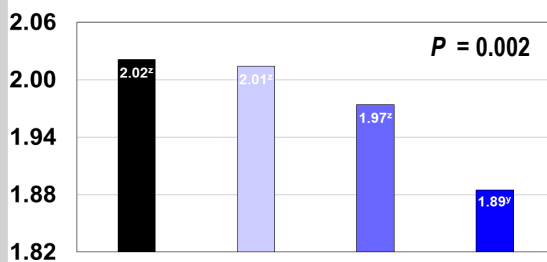
ZPM Improve Villus to Crypt Ratio



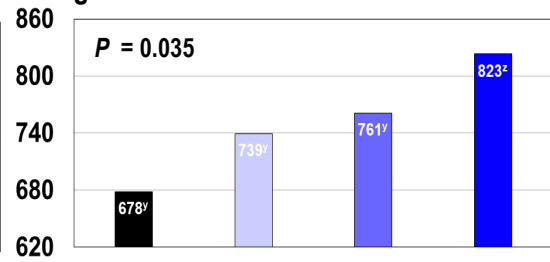
ZPM Improve Average Egg Mass, g



ZPM Improve FCR per Egg Mass



ZPM Improve Tibial Densitometry, mg/cm³



Conclusion

Total replacement of inorganic trace minerals by ZPM, even with levels 60% lower than the inorganic sources, promotes improvements in the intestinal and bone integrity, in addition to the productive parameters of White Lohmann laying hens.