

Production, nitrogenous compounds in manure, and serum chemistry of laying hens provided multi-species probiotics

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Table 1. Effects of probiotics by weeks on various nitrogenous compounds in pooled manure¹ of hens (32-week-old) for eight weeks.

Diets	Week 0	Week 4	Week 6	Week 8
NH ₃ ² concentration (ppm) ³				
Control ⁴	39.57	49.32	49.96	41.73
SD	4.33	4.56	2.09	1.12
Probiotics ⁵	39.57	42.22	46.48	42.91
SD	4.33	1.89	2.83	1.51
NH ₄ -N ² (ppm) ³				
Control ⁴	2513.33	2713.33	2640.00	1706.67
SD	240.07	81.45	28.28	193.48
Probiotics ⁵	2513.33	2613.33	2932.50	1850.00
SD	240.07	81.45	53.03	105.36
TKN ² (%) ³				
Control ⁴	4.60	4.64	4.63	4.71
SD	0.13	0.05	0.06	0.08
Probiotics ⁵	4.60	4.64	4.66	4.56
SD	0.13	0.10	0.02	0.01
TN ² (%) ³				
Control ⁴	4.95	4.87	5.01	4.91
SD	0.08	0.03	0.01	0.03
Probiotics ⁵	4.95	4.87	5.07	5.01
SD	0.08	0.03	0.08	0.04

¹Based on Proc GLM, means were calculated but no p-value was provided.

¹NH₃, ammonia; NH₄-N, ammonium nitrogen; TKN, total Kjeldahl nitrogen; TN, total nitrogen.

²Means are of 3-4 subsamples within the treatment.

⁴Control, commercial feed (16% Hi-Energy Layer Crumble manufactured by BAR ALE, Williams, CA).

⁵Bacteria (*Lactobacillus rhamnosus*, *Lactobacillus paracasei*, and *Lactobacillus plantarum*) each at 3.33×10^{11} cfu/kg feed for a total of 1.0×10^{12} cfu/kg in feed.

Table 2. Effects of probiotics by weeks on pooled serum measurements¹ of hens (32-week-old) for eight weeks.

Diets	Week 0	Week 4	Week 8
NH_3^1 (mg/dl) ²			
Control ⁴	1.05×10^{-4}	1.01×10^{-4}	1.14×10^{-4}
SD	6.80×10^{-6}	1.83×10^{-6}	3.56×10^{-6}
Probiotics ⁵	1.05×10^{-4}	1.43×10^{-4}	1.10×10^{-4}
SD	6.80×10^{-6}	1.98×10^{-6}	4.22×10^{-6}
UA^1 (mg/dl) ²			
Control ⁴	2.03	2.79	1.98
SD	0.25	0.14	0.03
Probiotics ⁵	2.03	2.72	1.69
SD	0.25	0.07	0.04
TP^1 (g/dl) ²			
Control ⁴	4.83	5.15	5.15
SD	0.17	0.10	0.12
Probiotics ⁵	4.83	5.14	5.20
SD	0.17	0.10	0.14
ALB^1 (g/dl) ²			
Control ⁴	1.87	2.03	2.04
SD	0.08	0.04	0.01
Probiotics ⁵	1.87	2.02	2.07
SD	0.08	0.04	0.04
CK^1 (U/L) ²			
Control ⁴	612.00	710.75	688.25
SD	78.30	54.64	14.34
Probiotics ⁵	612.00	922.75	688.25
SD	78.30	16.80	19.34

¹Based on Proc GLM, means were calculated but no p-value was provided.

²NH₃, ammonia; UA, uric acid; TP, total protein; ALB, albumin; CK, creatine kinase.

³Means are of 3 subsamples within treatment for NH₃ and 4 subsamples within treatment for UA, TP, ALB, CK, and UA in liver.

⁴Control, commercial feed (16% Hi-Energy Layer Crumble manufactured by BAR ALE, Williams, CA).

⁵Bacteria (*Lactobacillus rhamnosus*, *Lactobacillus paracasei*, and *Lactobacillus plantarum*) each at 3.33×10^{11} cfu/kg feed for a total of 1.0×10^{12} cfu/kg in feed.