Effects of a Probiotic and it's Carrier Supplementation on Performance and Nutrient Digestibility of Broiler Chick

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Objectives.

To determine if the performance of broilers fed diets based on corn, wheat and soybean meal could be enhanced with probiotic and two types of carriers.

Introduction.

Probiotics are a class of feed additive that have been shown to improve prowth, digestion and conversion for poultry

Methods.

Two day old, female broilers were assigned to one of four treatments in a completely randomized design and housed in groups of four with six cages per treatment. The three experimental diets consisted of the basal diet supplemented with 0.1% of probiotic + carrier-I(yellow earth), 0.05% probiotic + carrier-I or probiotic 0.05% + carrier-II(malt, yellow earth, zeolite and enzyme mixture). The probiotic was composed of Rhodopseudomonas capsulata, Bacillus subtilus, Bacillus coagulance and Clostridium butyricum.

Results.

Over the 42 day experiment, feed conversion of birds fed the probiotic treatment (0.1% + carrier-I and 0.05% carrier-I) was superior ($P=0.02$) to the control. Feed intake and daily gain did not differ among treatments ($P>0.05$). Compared with the control, supplementation with 0.1% probiotic + carrier-I significantly increased the digestibility of energy and methionine ($P<0.05$). In contrast, the digestibility of argine and methionine was lower ($P<0.01$) for birds supplemented with 0.05% probiotic + carrier-II than the control.

Conclusions.

The performance of broilers was significantly enhanced by the addition of a probiotic with carrier I to the diet. However, under the conditions of this experiment, supplementation with a carrier containing yellow earth, zeolite and enzyme mixture (Carrier II) failed to improve broiler performance.

Table 1.

Effects of probiotic supplementation on the performance (0 to 42 days) of broiler chickens*

	Control	Control + 0.1% probiotics with carrier 1 *	Control +0.05% Probiotics with carrier 1	Control + 0.05% Probiotics with carrier 2 **	SEM	P value
Weight gain, g/d						
0 to 10 d	22.6^{c}	23.3^{a}	23.2^{ab}	22.7^{bc}	0.19	0.03
11 to 24 d	67.6	67.9	67.2	66.5	0.70	0.51
25 to 42 d	81.8	83.5	82.4	81.8	1.44	0.82
0 to 42 d	63.0	64.0	63.3	62.6	0.66	0.51
Feed intake, g/d						
0 to 10 d	25.4	25.3	25.5	25.2	0.26	0.92
11 to 24 d	94.3	92.2	92.2	92.3	0.90	0.29
25 to 42 d	149.6	147.7	146.5	146.4	1.64	0.49
0 to 42 d	101.6	100.7	99.6	99.5	0.87	0.32
Feed conversion, g/g						
0 to 10 d	1.12^{a}	1.09^{c}	1.10^{bc}	1.11^{ab}	0.007	<0.01
11 to 24 d	1.40	1.36	1.37	1.39	0.019	0.52
25 to 42 d	1.83	1.77	1.78	1.79	0.025	0.35
0 to 42 d	1.61^{a}	1.56^{b}	1.57^{b}	1.59^{ab}	0.011	0.02

^{a,b,}Means in the same row with same or no superscript do not differ ($p>0.05$)
* Carrier 1 is composed of yellow earth
** Carrier 2 is composed of malt, yellow earth, zeolite and enzyme

Table 2.

Effects of probiotic supplementation on total tract apparent nutrient digestibility coefficients (%) for broiler chicks1,2

	Treatments				SEM	P value
	Control	Control + 0.1% probiotics with carrier 1 *	Control +0.05% Probiotics with carrier 1	Control + 0.05% Probiotics with carrier 2 **		
Nitrogen	57.5	63.7	59.7	46.3	2.33	0.15
Energy	76.1^{bc}	79.2^{a}	78.3^{ab}	74.2^{c}	0.91	<0.01
Essential amino acids						
Arginine	90.4^{a}	90.7^{a}	90.8^{b}	88.3^{b}	0.48	<0.01
Histidine	88.3^{ab}	88.7^{a}	89.0^{a}	86.7^{b}	0.60	<0.05
Isoleucine	88.5^{ab}	89.4^{a}	88.8^{a}	86.6^{b}	0.67	0.04
Leucine	90.6	91.3	91.0	89.9	0.47	0.22
Lysine	87.6	87.9	88.0	85.9	0.70	0.14
Methionine	91.5^{b}	93.3^{a}	91.7^{b}	89.5^{c}	0.38	<0.01
Phenylalanine	88.9	89.6	89.5	87.6	0.56	0.07
Threonine	84.2	85.1	84.9	82.3	0.82	0.09
Valine	83.6	84.4	84.0	81.3	0.84	0.08

[1]Six replicate cages for the digestibility data.
[2]Means in the same row with the same or no superscript do not differ ($p>0.05$)