Bm-2 (EM Bokashi) supplement improves layers productivity

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ABSTRACT

The objectives of this study were to test layers' egg productivity by Bm-2 supplement in diets. Laying hens (180 hens, each sixty of 250, 350, 450-days old, ISA Brown) were purchased from local farm. Hens were randomly assigned in control and Bm-2 supplement group. Treatment was made with 3% Bm-2 supplement in diet for 3 month. Bm-2 is AMO™ (EM) Bokashi which fermented with rice bran or wheat bran and was provided by Korin Korea Co. The general management was followed by the Procedure of Animal Experimental Station in Chonnam National University. After two weeks of adaptation period, eggs were collected daily. Egg laying rate and egg weight were increased 3.75% and 3.67%, respectively. Although egg width was increased only 0.9%, the egg length was increased 5.93%. The egg shell thickness was increased 1.70% and then egg breakage was decreased about 22%. In conclusion Bm-2 treatment increased egg laying rate and egg weight, but it decreased egg breakage.

INTRODUCTION

Microorganisms were effectively applied in animal agriculture. These microbes enhanced diet availability due to efficient metabolism in the body. Yeast fermented diets have been used in many animals. Dried yeast (*Saccharomyces boalardii*) supplement (0.1% and 10%) were significantly reduced salmonella (Line et al., 1995; Savage and Zakrzewska, 1995). Yeast culture (0.1% Yea-Sacc[1026]) was improved feed efficiency (Ignacio and Sefton 1995).

Effective microorganism (EM) has been widely used for agriculture natural farming. EM improve soil microbes activity and their characteristics for the plants. In animal uses, EM may change gut nutrient digestion and absorption rate. Carbohydrate fermentation will be significantly enhanced and then energy metabolism is most efficient. EM contains many different microorganisms which are naturally occurring in ground. A few EM studies have been conducted in animal farming. Most of these results are positively enhanced animals productivity. Also, when they spray in the barn or manure, pathogenic microbes and odor are significantly reduced. Bm-2, EM Bokashi, is fermented diet with Amo™ applied in rice bran or barley bran. Amo™ contained more than seventy effective microorganisms, i.e. yeast, a*spergilus orygae, lactobacillus* etc. The objectives of this experiment were to test Bm-2 (EM fermented diet) which was supplied by Korin Korea Co., in layers' productivity.

MATERIALS AND METHODS

Animals and Management

One-hundred eighty layers (ISA Brown, each sixty of 250 days, 350 days 450 days old) were purchased from local farm. Animals were randomly assigned in cage (three birds per cage)

each 30 birds in control and Bm-2 supplement group. Animals were managed based on General Animal Management Guide of Chonnam University Animal Farm. Cage was completely cleaned based on all- in and all-out procedure.

Layers were adapted for two weeks before experiment. Treat group was fed 3% Bm-2 supplement in commercial layer diet for 3 months. Untreated group was fed only commercial layer diet.

Measurement

Feed consumption amount was measured weekly. Daily feeding amount was recorded and subtracted unconsumed diet in each group. Eggs were collected every day at same time (10:00) and calculated egg laying rate. Broken eggs were separately treated. All eggs were weighed and then separated 4 groups (<60g small, 61-70g middle, 71-80g large, >80g ex-large) based on weight. Six eggs were randomly collected from each group and measured egg weight, yolk weight, shall weight using electric balance and measured egg length, width, shell thickness using calipers.

RESULTS AND DISCUSSION

Layers were supplemented with 3% Bm-2 in commercial layer diet for 90days. Early layers data is appeared in table 1. Egg laying rate was increased from 80% to 83% by Bm-2 supplement. Egg weight was 63.71g in control and 66.05g in supplement. The change contribute egg productivity due to each weight egg was increased 2.34g. However, yolk weight was decreased from 16.33g to 16.08g in supplement. Low; yolk weight may reduce total cholesterol level of egg. Generally, the cholesterol concentration maintained regardless egg weight. On the other hand, egg size give interesting result. Egg length increased 5.93% by treatment, but width increased only 0.9%. we can not conclude the meaning of these size change. However, it also contribute the egg productivity.

Egg shell thickness increased 1.7% by Bm-2 supplement. Shell weight was increased 3.85% due to Bm-2 treatment. The reason of heavy shell weight not only enhanced shell thick but also increased egg weight and size. Although shell thickness was enhanced only about 7um, egg breakage was significantly diminished. Egg breakage was 1.8% in control and 1.4% in Bm-2 supplement. Therefore, shell breakage was reduced 22.2% Bm-2 supplement due to enhanced shell thickness and shell weight. Egg size have some different meaning.

Middle and late laying period data were in table 2 and 3. The overall results were similar compare to early period, but their improving range is smaller than early laying period. The egg breakage rate is significantly diminished unto 100% by Bm-2 supplement. Also the number of small and middle size eggs were decreased, but large and ex-large eggs were increased in same period. Although we did not show the feed data feed consumption was not increased by the Bm-2 treatment.

Table 1. The effect of Bm-2 (EM Bokashi) on layers productivity at early laying period (day 250-340).

		Control	Bm-2 (EM)	% change
Laying rate (%)		80	83	3.75
Egg wt. (g)		63.71	66.05	3.67
York wt. (g)		16.33	16.08	-1.53
Length (mm)		57.48	60.89	5.93
Width (mm)		44.66	45.06	0.90
Shell thick (mm)		0.412	0.419	1.70
Shell wt. (g)		7.27	7.55	3.85
Breakage (%)		1.80	1.40	22.22
Egg size (%)	Small	33.97	23.3	-31.41
	Middle	59.15	63.08	6.64
	Large	6.82	13.31	95.16
	Ex-large	0.06	0.31	417

Table 2. The effect of Bm-2 (EM Bokashi) on layers productivity at middle laying period (day 350-440).

		Control	Bm-2 (EM)	% change
Laying rate (%)		77	79	2.60
Egg wt. (g)		65.33	67.53	3.37
York wt. (g)		17.21	18.01	4.65
Length (mm)		58.27	58.75	0.82
Width (mm)		44.83	45.51	1.52
Shell thick (mm)		4.31	4.39	1.86
Shell wt. (g)		7.71	7.94	2.98
Breakage (%)		1.4	0.7	-100
Egg size (%)	Small	15.21	22.10	45.30
	Middle	68.61	61.34	-10.60
	Large	15.78	15.87	0.57
	Ex-large	0.40	0.69	72.5

Table 3. The effect of Bm-2 (EM Bokashi) on layers productivity at late laying period (day 450-540).

		Control	Bm-2 (EM)	% change
Laying rate (%)		58	62	6.90
Egg wt. (g)		65.33	67.53	3.14
York wt. (g)		17.21	18.01	6.39
Length (mm)		60.15	61.18	1.71
Width (mm)		45.7	45.98	0.61
Shell thick (mm)		4.21	4.24	0.71
Shell wt. (g)		7.98	8.15	2.13
Breakage (%)		3.7	2.9	21.62
Egg size (%)	Small	2.61	1.51	-42.15
	Middle	52.49	48.09	-8.39
	Large	41.89	41.96	0.17
	Ex-large	2.99	8.44	182

CONCLUSION

Bm-2 (EM Bokashi) was supplemented 3% in laying diet for 3 months. Egg laying rate and egg weight were increased 3.75% and 3.67%, respectively. Although egg width was increased only 0.9%, the egg length was increased 5.93%. The egg shell thickness was increased 1.7% and then egg breakage was decreased about 22%. In conclusion, Bm-2 treatment increased egg laying rate and egg weight, but It decreased egg breakage. Therefore, Bm-2 supplement improves layer productivity.