

Production Performance of Broilers fed different Feed Additives

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RINGKASAN

Suatu kajian terhadap pengeluaran ayam-ayam pedaging yang diberikan berbagai "feed additives" (Lactozyme, Jimplex and Nutrifac) tidak menunjukkan perbezaan yang penting diantara purata-purata rawatan (treatment means) berkenaan dengan pengambilan makanan dan pertukaran makanan. Bagi kenaikan berat perbezaan yang penting ($P < 0.05$) di antara kumpulan Jimplex dengan kumpulan Kontrol adalah didapati. Ayam-ayam pedaging dari kumpulan Jimplex adalah lebih berat sebanyak 5.92% dan telah mendapat pendapatan terhadap kos makanan bagi seekor burung yang lebih tinggi sebanyak \$0.13, jika dibandingkan dengan kumpulan Kontrol pada masa 63 hari.

SUMMARY

A study of the production performance of broilers fed different feed additives (Lactozyme, Jimplex, and Nutrifac), indicated no significant difference among the treatment means concerning feed consumption and feed conversion. For weight gain, there was a significant difference ($P < 0.05$) between the Jimplex and Control groups. Broilers from the Jimplex group were 5.92% heavier and had a higher income over feed cost per bird by \$0.13 when compared to those from the control group at 63 days of age.

INTRODUCTION

The poultry industry in Malaysia is increasingly becoming more advanced and commercialized with the result that more and more farmers are veering towards mechanization and integration. It has also stimulated the growth of other associated industries like the livestock feed industry, (Oh, 1978). In the future there will be an increasing demand for poultry meat. Projections indicate that from 1979 to 1980 the country will require an increase of 353.1 million pounds of poultry meat (Mahendranathan and Leong, 1974). With the increased use of appropriate modern technology, there is every likelihood of poultry farmers improving production efficiency. Oh *et al* (1978) reported that maximum profit in broiler production could be realized by using farm-mixed rations. High density diets as described by Raghavan *et al* (1978) could also lead to improved production performance. Feed additives are used in commercial or farm-mixed poultry ration and these have the effect of improving performance. The objective of this study therefore was to determine the performance of broilers fed different feed additives.

MATERIALS AND METHODS

A randomized complete-block design with more than one observation per experimental unit,

as described by Steel and Torrie (1960) was used. In this design a total of 1,500 day-old chicks were used and assigned to five blocks with each block having 300 birds. As there were four treatments in each block, each treatment contained 75 birds. Each treatment in each block essentially had three observations with 25 birds assigned to each observation. The birds were kept in raised cages with each cage measuring 3' X 8' X 1¼' for each observation.

The four treatments were designated treatments L, J, N and C. Treatments L, J and N were rations containing Lactozyme, Jimplex and Nutrifac respectively. Lactozyme, Jimplex and Nutrifac are different commercial feed additives. Lactozyme is a non-antibiotic feed additive containing aromatic, latic-acid bacteria (*Lactobacillus* and *Streptococcus*), enzymes (renin bromelain and lactase) Vitamin B-complex and Unknown Growth Factor (U.G.F.). Jimplex is derived from the culture of non-pathogenic strain of *Bacillus subtilis* and *Aspergillus oryzae* on selected wheat bran. It is basically a multiple enzyme (amylase, protease and gumase) supplement. Nutrifac is a feed supplement prepared from antibiotic fermentation residues containing U.G.F., Vitamin B-complex, minerals and aminoacids. The cost of the additives was the same and calculated at \$0.95 per 100 lb. (45.45 kg) of pre-

pared ration for treatments L, J and N. In treatments L and J, 50 gm each of Lactozyme and Jimplex were added to every 100 lb. of prepared ration. Treatment N contained 300 gm of Nutrifac for every 100 lb of prepared ration. Treatment C had no special feed additive in the ration.

Table 1 shows the calculated chemical composition of the farm-mixed broiler starter and finisher rations. The starter diet was given to the birds up to the fifth week whereas from the sixth to the ninth week the finisher diet was used.

TABLE 1
Calculated Chemical composition of Broiler Rations

Item	Starter	Finisher
Crude Protein (%)	23.90	20.00
Ether Extract (%)	6.00	8.20
Crude Fiber (%)	3.70	3.60
Calcium (%)	1.20	0.90
Available Phosphate (%)	0.51	0.45
Met. Energy (Kcal/kg)	3060	3280

Body weights and feed consumed were recorded at weekly intervals up to nine weeks. Mortality of birds was also recorded during the nine week period so that adjustments could be made for body weight gains, feed consumption and feed conversion. The birds were also vaccinated against Ranikhet and Fowlpox according to the recommended vaccination programme.

RESULTS AND DISCUSSION

The treatment means for feed consumption, weight gain and feed conversion are shown in Table 2. The mean feed consumption values for the different treatments ranged from 4.57 to 4.71 kg. These differences in values were however not significant as indicated in Table 3. Chickens receiving feed containing Jimplex had the highest body-weight gain of 2.27 kg per bird, while the lowest body-weight gain of 2.15 kg. per bird was found in the Control group. This difference in weight gain was 5.92% in favour of the Jimplex group. The Lactozyme and Nutrifac groups each had weight gains of 2.21 kg.. The F-test for weight gain in Table 4 showed a significant difference among the treatment groups, at the 5% level. By Tukey's w-procedure (Steel and Torrie, 1960), it was found that the difference between the Jimplex and Control means was significant ($P < 0.05$). The differences between the other treatment means

TABLE 2
Treatment Means \pm S.E. for Feed Consumption (kg)
Weight Gain (kg) and Feed Conversion per bird
up to 9 weeks

Treatment	Feed Consumption (kg)	Weight Gain (kg)	Feed Conversion
L	4.67 ± 0.10	2.21 ± 0.04	2.12 ± 0.06
J	4.71 ± 0.13	2.27* ± 0.04	2.07 ± 0.05
N	4.61 ± 0.15	2.21 ± 0.03	2.10 ± 0.08
C	4.57 ± 0.12	2.15* ± 0.03	2.13 ± 0.05

L = Lactozyme, J = Jimplex, N = Nutrifac, C = Control
* Values are significantly different ($P < 0.05$) from each other.

TABLE 3
Analysis of Variance (Feed Consumption per bird)

Source of Variation	df.	SS	MS	F
Block	4	10.27	2.57	
Treatment	3	0.17	0.06	0.77 n.s.
Experimental Error	12	0.89	0.07	
Sampling Error	40	2.12	0.05	
Total	59	13.45		

F0.05 (3, 12 df) = 3.49

TABLE 4
Analysis of Variance. (Weight Gain per bird)

Source of Variation	df.	SS	MS	F
Block	4	0.28	0.07	
Treatment	3	0.12	0.04	3.71*
Experimental Error	12	0.13	0.01	
Sampling Error	40	0.46	0.01	
Total	59	0.99		

F0.05 (3, 12 df) = 3.49

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were all not significant. As for feed conversion, no significant difference was found among the treatment means (Table 5). The mean values for feed conversion ranged from 2.07 to 2.13.

TABLE 5
Analysis of Variance (Feed Conversion)

Source of Variation	df.	SS	MS	F
Block	4	2.41	0.60	
Treatment	3	0.04	0.01	1.07 ^{n.s.}
Experimental Error	12	0.15	0.01	
Sampling Error	40	0.56	0.01	
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Total	59	3.16		

F_{0.05} (3, 12 df) = 3.49

It is interesting to note (Table 2) that birds from the Jimplex group apparently consumed more feed, gained fastest and gave the lowest feed conversion ratio, while birds from the Control group apparently consumed less feed, gained slowest and gave the highest feed conversion ratio, despite the lack of statistical evidence. However, on the basis of the significant difference between the Jimplex and Control groups for weight gain, it might perhaps be more profitable to use feed containing Jimplex. This is indicated in Table 6 which shows a difference of \$0.13 in income over feed cost. This difference is in favour of the Jimplex group.

TABLE 6
Income Over Feed Cost per bird

	Jimplex	Control
Average Feed Cost per bird (\$)	2.97	2.79
Average Sale Price per bird (\$)*	5.88	5.57
Income Over Feed Cost per bird (\$)	2.91	2.78

(Difference in Income Over Feed Cost per bird = \$0.13)

* The market price of chicken was \$2.48/kg wt.

It is further noted that birds from the Lactozyme, Jimplex and Nutrifac groups consumed more feed, gained heavier weights, and showed lower feed conversion than birds from the Control group.

In view of the above observations it is envisaged that there will be an increasing practice by poultry farmers, who mix their own poultry rations, to incorporate feed additives in rations.

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