



**UNIVERSITI PUTRA MALAYSIA**

**EFFECT OF DIETARY BOKASHI SUPPLEMENTATION ON THE  
PERFORMANCE OF COLOUR BROILER CHICKEN**

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**FP 2016 105**

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CHICKEN**

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**EFFECT OF DIETARY BOKASHI SUPPLEMENTATION  
ON THE PERFORMANCE OF COLOUR BROILER  
CHICKEN**

**By**

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## CERTIFICATION

This project entitled 'EFFECT OF DIETARY BOKASHI SUPPLEMENTATION ON THE PERFORMANCE OF COLOUR BROILER CHICKEN' is prepared by Mazlinda binti Zakaria and submitted to the Faculty of Agriculture in fulfillment of the requirements of the course SHW 4999 (Final Year Project) For the award of the degree of BACHELOR OF AGRICULTURE (ANIMAL SCIENCE)

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# **EFFECT OF DIETARY *BOKASHI* SUPPLEMENTATION ON THE PERFORMANCE OF COLOUR BROILER VILLAGE CHICKEN**

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Keywords: Colour Broiler Chicken, Effective Microorganism (EM), *Bokashi*, Rice Bran

## **ABSTRACT**

A study was conducted to evaluate the effect of the effective microorganisms (EM) in the feed on the performance of colour broiler chickens. EM *Bokashi* is the dry form product of fermented rice bran with effective microorganism (EM) activated solution. Factorial design was used in this experiment. Ninety unsexed colour broiler chicken day-old chicks were randomly allocated into three experimental treatments. Chickens were fed with three different dietary treatments. It consists of treatment 1 (0% EM Bokashi, but with 2% untreated rice bran) as control, treatment 2 (2% EM Bokashi) and treatment 3 (4% EM Bokashi) in the feed. Each treatment had three replicates and five birds per cage. Twenty one days old chicks were separated between female and male and grouped randomly according to their sex after they were with commercial starter feed from day old and water *ad libitum*. Broiler starter ration was continued until day 35. Day old chickens, and grower ration was fed from 36 days to 63 days of age. The EM *Bokashi* was added into the respective ration starting from day 21-days old chicks. The amount of feed consumption was recorded daily. Weekly body weight of the chicks was also recorded. From the

data, average feed consumption, average body weight, weight gain and feed conversion ratio (FCR) were calculated. The results suggested that the weight gain and feed conversion ratio (FCR) were significantly different between treatments. There was significantly better differences ( $P < 0.05$ ) in average body weight among the treatments. Average feed intake of chicken was significantly inferior difference among the three treatments. Average weekly weight gain of chicken in T3 have slightly significant differences ( $P < 0.05$ ) among the treatments. There was significantly higher differences ( $P < 0.05$ ) on average feed conversion ratios (FCR) among the treatments. In conclusion, feeding different level of *Bokashi* give will improve the body weight, body weight gain, feed intake and feed convention ratio.

# EFFECT OF DIETARY BOKASHI SUPPLEMENTATION ON THE PERFORMANCE OF COLOUR BROILER CHICKEN

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Keywords: Hybrid Village Chicken, Effective Microorganism (EM), *Bokashi*, Rice Bran

## ABSTRAK

Satu kajian telah dijalankan untuk menilai kesan mikroorganisma efektif (EM) dalam makanan kepada prestasi ayam kampung. EM *Bokashi* adalah pencampuran dedak beras dan mikroorganisma efektif (EM). Reka bentuk faktorial telah digunakan dalam eksperimen ini. Sembilan puluh ekor ayam kampung berumur satu hari ditetapkan secara rawak kepada tiga rawatan eksperimen. Ayam diberi makan dengan tiga rawatan pemakanan yang berbeza. Ia terdiri daripada rawatan 1 (0% EM *Bokashi* tetapi 2% debu beras) sebagai kawalan, rawatan 2 (2% EM *Bokashi*) dan rawatan 3 (4% EM *Bokashi*). Setiap rawatan mempunyai tiga ulangan dan setiap sangkar mempunyai lima ekor anak ayam. Setelah tiga minggu usia anak ayam, anak-anak ayam tersebut, dipisahkan antara betina dan jantan, dan dikumpulkan secara rawak mengikut jantina ayam. Ayam diberi makan dan menyediakan air secara *ad libitum* semasa tempoh penyesuaian sehingga hari pengasingan ayam mengikut jantina. (anak ayam berusia 21 hari). Makana pemula telah diberi makan kepada anak-anak ayam dari hari pertama hingga ayam berusia 35 hari. Manakala makanan pembesaran diberikan pada dari 36 hari kepada 63 hari

umur. EM *Bokashi* telah ditambah ke dalam makanan dalam setiap rawatan bermula 21-hari anak ayam. Jumlah penggunaan makanan dicatatkan setiap hari. Berat badan mingguan anak ayam dicatatkan juga untuk setiap replikasi kumpulan. Daripada data, penggunaan purata makanan, purata berat badan, berat badan dan nisbah penukaran makanan (FCR) telah dikira. Kajian telah dilakukan dan hasil ujian menunjukkan bahawa nisbah berat badan dan makanan penukaran (FCR) berbeza secara ketara dalam rawatan. Terdapat perbezaan yang signifikan ( $P < 0.05$ ) dalam purata berat badan antara rawatan. Pengambilan makanan purata ayam perbezaan yang signifikan antara ketiga-tiga rawatan. Purata pertambahan berat badan mingguan ayam mempunyai perbezaan signifikan ( $P < 0.05$ ) antara rawatan. Terdapat perbezaan yang signifikan ( $P < 0.05$ ) secara purata nisbah penukaran makanan (FCR) di kalangan rawatan. Kesimpulannya, makan tahap yang berbeza Bokashi memberi akan meningkatkan nisbah berat badan, berat badan badan, pengambilan makanan dan ratio makanan konvensional.

# CHAPTER 1

## INTRODUCTION

### 1.1 History

The Malaysian poultry industry has become one of the most highly organized sectors compared to the ruminant industry sector. The chicken is fast growing, which able to grow in the country with high temperature and rainfall season because there are placed in suitable housing system. The chickens act as the major source of food and also give proteins to people.

Village chickens or indigenous chicken (*Gallus domesticus*) are the most common types of poultry raised in the rural areas. In general villagers produce to keep small flocks of between 5 to 20 birds per household (Guèye, 1997). Village chickens are generally raised on a free-range system where they survive as scavengers. They are maintained with low land, labor and capital costs, resulting in almost every household and the poorest social strata of the rural population keeping them. Village chicken is usually reared in free range system and semi intensive system.

Based on low inputs and outputs, village chicken production represents an important part of a balanced farming system with a unique role in the economy of the rural household. They act as the source of high quality protein for the family, provide a small income and play a part in the cultural life of the society. Reports in literature have revealed that indigenous chickens take long period to reach maturity and lay fewer clutches of eggs per year compared to modern breeds (Safalaoh, 1997).

Demand for village chicken meat is very good. However, the supply of indigenous village chicken is not sufficient to meet the rising in market demand. Since the 1990's, most of the demand for village chicken in the market is met by the importation of colour broiler breeders from overseas, in particular Europe. A handful of colour broiler breeder farms have been supplying colour broiler chicks for the past two decades to substitute for the shortage of indigenous village chicken. Free ranging colour broiler breeds like Sasso and Kabir were commonly used. However, their meat characteristics have never been compared to those of indigenous village chicken. Also, there is limited information on the performance of colour broiler chicken under improved feeding management.

In livestock industries, the cost of feeding takes about 70% of the operating cost. This is what concerns most of the farmers about on running a farm. The feed should have good nutritive values and available locally. It plays an important part in the food chain and has implication for the composition and quality of the livestock products that people consume. Nowadays, Malaysia is an exporter country for certain agricultural products. Malaysia is different with other exporter country likes Indonesia and Thailand because, Malaysia does not process the agricultural by product maximally and efficiently.

Rice bran is the example of agriculture by-product that can be utilized as livestock feed. Rice bran is a byproduct of the rice (*Oryza sativa*) industry. The bran is the hard outer layer of rice grains that is removed when processing brown rice into white. Rice bran is a mixture of hull, germ and bran that is suitable for poultry feeding and rich in protein (Mulyantini *et al.*, 2005). It also contains high levels of the B-vitamins, vitamin E, and some trace minerals (Farrell and Hutton, 1990). Rice bran is suitable as a grain substitute, equivalent to wheat in feeding value if of good quality. Rice bran is probably the cheapest feed resource for a unit of many nutrients and

energy for poultry and, thus the feeding cost can substantially be reduced by increasing the nutritive value and the level of rice bran in poultry diets.

The advances in information technology able to create a new environment-friendly that will replacement product that can be made from agriculture and other renewable feedstock. The agriculture by-products are normally low in its nutritive contents. However, it can be improved by various treatments such as chemical, physical and by introducing effective microorganisms to the feedstuff. The effective microorganism (EM) is the most popular microbial technologies that being used in the worldwide and the products have been on the market since 1983 in Japan.

EM is one of the better technologies that able applied towards the feed to produce good quality type of feed. Nowadays EM is used in many systems pertaining to agriculture and environmental management. These range from crop and animal production systems, to livestock and aquaculture units. EM is used widely in environmental management for decomposition and more importantly for recycling of wastes, both solids and liquids.

Bokashi is a Japanese word which means “fermented organic matter”. It is made by fermenting organic matter such as rice bran, oil cake or fish meal mixed with EM (effective microorganism). Bokashi refers to using of EM in anaerobic stage. This stage takes place in the absence of oxygen. An inoculant is made using EM in a carrier such as wheat or rice bran. Inoculant can also be made in a liquid form using EM, water and molasses. EM comes in powder form and liquid form and consists of naturally-occurring beneficial microorganisms. As reported by Konoplya and Higa (2000), EM was successfully used in poultry and swine as feed constituent and sanitation spray. Throughout the world, EM applications are made in the farming, decomposition, livestock, health industries and environmental clean-up for polluted waterways,

lakes and lagoons. Research has found that EM can help in improving growth promotion in chicken.

(Ahmed *et al.*, 1996) has concluded in his report that EM is a safe product and this technology can be applied for promoting growth and for inducing immune response in broiler. The programs on EM undertaken in over 60 countries show its success. The initial research undertaken in agriculture paved the way for case studies and large-scale use of EM in a diverse range of environments. This showed that there are many benefits of EM; therefore by taking an advantage of EM, a study was conducted on rice bran to know whether the chicken growth performance can be increased or not when treated with or without effective microorganism.

## **1.2 Significant Of Study**

In this study, rice bran is treated with and without EM, and was evaluated to determine their effectiveness on colour broiler chicken performance. This innovation in agricultural by-product usage has the potential to increase farmer revenue by reducing the use of expensive feedstuff to feed their chickens. Hence, this also will improve the village chicken growth so that can be marketed much earlier. Thus, *Bokashi* was proposed to be used as an alternative dietary supplement into the commercial feed.



### 1.3 Objectives

General objective of present study is to determine the effect of dietary *Bokashi* supplementation on the performance of colour broiler chicken.

The specific objectives as follow:

1. To determine the performance colour broiler chicken by feeding different levels of *Bokashi* in the feed.
2. To compare the responses to *Bokashi* feeding between males and females colour broiler chicken.

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