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BY

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A project report submitted to Faculty of Agriculture, Universiti Putra Malaysia, in fulfillment of the requirement of SHW 4999 (Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science)

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ENDORSEMENT

This project report entitled 'Effect of black pepper as natural feed additive on performance of guinea fowl' is prepared by Norazilah binti Azmi and submitted to the Faculty of Agriculture in fulfillment of the requirement of SHW 4999 (Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science).

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LIST OF ABBREVIATIONS

BWt	Body weight gain
CF	Commercial feed
CP	Crude protein
DM	Dry matter
DOC	Day old chick
EE	Ether extract
FCR	Feed conversion ratio
H_2SO_4	Sulphuric acid
M	Moisture
ND	Newcastle Disease
NE	Net energy

Units

%	Percent
°C	Celcius
g	Gram
g/bird	Gram per bird
kcal	Kilocalorie
kg	Kilogram
mg	Milligram
mL	Milliliter
mm	Millimeter

Statistical terms

ANOVA	Analysis of variance
CRD	Completely Randomized Design
P	Probability
SPSS	Statistical Package for the Social Sciences

ABSTRAK

Antibiotik pertumbuhan (sub-terapeutik) sebagai bahan tambahan makanan haiwan ternakan telah diamalkan untuk memaksimumkan prestasi dalam pengeluaran haiwan ternakan. Parai penyelidik mencari alternatif kepada antibiotik pertumbuhan oleh kerana isu antibiotik rintangan. Kesan penambahan lada hitam sebagai bahan tambahan makanan semula jadi pada prestasi ayam mutiara telah dikaji. Objektifnya adalah untuk menentukan kesan lada hitam sebagai bahan tambahan dalam makanan semula jadi sebagai pendorong pertumbuhan ayam mutiara. Sebanyak 45 anak ayam mutiara pada usia tiga minggu, dibahagikan secara rawak dalam tiga kumpulan rawatan. Setiap kumpulan dibahagikan lagi kepada tiga ulangan pada kadar lima anak ayam mutiara setiap bahagian dalam reka bentuk rawak lengkap. Rawatan diet ini telah dibahagikan kepada tiga diet yang berbeza iaitu Rawatan 1 (T1) di mana anak ayam mutiara diberi makan yang mengandungi makanan komersil 100%, Rawatan 2 (T2) dengan makanan komersil dan 0.5% lada hitam, dan Rawatan 3 (T3) dengan makanan komersil dan 1.0% lada hitam. Rawatan diet telah diberi selama tempoh 12 minggu. Kesihatan dan prestasi parameter ayam mutiara direkodkan. Hasil kajian menunjukkan bahawa prestasi ayam mutiara tidak signifikasi dipengaruhi oleh penambahan lada hitam. Walaubagaimanapun, terdapat perbezaan diantara penambahan berat badan, pengambilan makanan dan nisbah penukaran makanan bagi rawatan yang berbeza. T2 (0.5% lada hitam) mempunyai berat berat badan yang tinggi berbanding T1 dan T3. Ayam mutiara di T3 (1.0% lada hitam) mempunyai pengambilan makanan ternakan yang tertinggi. Penambahan lada hitam dalam diet tidak memberi kesan ke atas morbiditi dan kematian ayam mutiara. Semua ayam kelihatan sihat dan tiada kematian direkodkan semasa eksperimen. Kesimpulannya, penambahan lada hitam sebagai bahan tambahan makanan haiwan ternakan tiada signifikasi ($p < 0.05$) meningkat terhadap prestasi pertumbuhan ayam mutiara.

ABSTRACT

Antibiotic growth promotion (sub-therapeutic) as feed additive has been practiced to maximize performance in poultry production. Researchers searched for alternatives to antibiotic growth promoters due to antibiotics resistance issues. The effect on addition of black pepper as natural feed additive on performance of guinea fowls was studied. The objective is to determine the effect of black pepper as natural feed additive as growth promoters in guinea fowl. A total of 45 keets at the age of three weeks were randomly divided into three treatment groups. Each group was further subdivided into three replicates at the rate of five keets per partitions in complete randomized design. The diet treatment were divided into three different diets namely Treatment 1 (T1) where the keets were fed with 100% commercial feed, Treatment 2 (T2) with commercial feed and 0.5% black pepper, and Treatment 3 (T3) with commercial feed and 1.0% black pepper. The experimental diets were fed for 12 weeks duration. Health of the stock and performance parameters was recorded. The results showed that, guinea fowl performance was not significantly influenced by addition of black pepper. However, there was difference between body weight gain, feed intake and feed conversion ratio for different treatment. T2 (0.5% black pepper) had significantly heaviest body weight gain compared to T1 and T3. The keets at T3 (1.0% black pepper) had significantly highest feed intake. Addition of black pepper in diet did not give effect on the morbidity and mortality of guinea fowl. All the keets were apparently healthy and no mortality was recorded during experiment. It was concluded that addition of black pepper as feed additive was not significantly ($p < 0.05$) improved on growth performance of guinea fowl

CHAPTER 1

INTRODUCTION

1.1 Background of study

Guinea fowl originated from Africa and distinct popularity with smallholder farmers (Jacquie Jacob and Tony Pescatore, 2013). There is a potential market for guinea fowl products due to their quality of meat. The meat of young guinea is tender and good for health because it has many nutritional qualities, thus the meat is expensively sold by supplier in Malaysia. The meat is lean and rich in essential fatty acids. Guinea fowl meat is leaner than chicken meat. This is because chicken meat has high cholesterol content than guinea fowl. The nutritional value of edible meats is given in Table 1.1.

Table 1.1: Nutritional Value of Edible Meats

Edible Portion	% Protein	% Fat
Guinea Hen	23.4	8.9
Chicken	20.0	17.9
Muscovy Hen	21.1	18.3
Muscovy Drake	18.9	18.0
Pecking Duck	16	28.6

Source: Nutritional Information, 2015

Besides, guinea fowl have ability to protect itself against predators and better resistance to common poultry parasites and diseases such as Newcastle Disease (ND) and Fowl Pox (Saina, 2005) compared to commercial chicken. All of these reasons because genetic of commercial chicken has been modified due to its position as a commercial purpose. However, the growth performance of guinea fowl is slow. This is supported by observations made by Saina (2005) on four local varieties in Nigeria. Indigenous guinea fowl varieties have lower body weights.

For marketing, guinea fowl are ready at 16 to 18 weeks of age when they are sold. Due to this problem, the farmers need to improve guinea fowl production and performances by adding antibiotics as feed additive in diets. Addition antibiotics as feed additives in livestock feed to stimulate growth have been widely used (Castanon, 2007). Some antibiotics trigger livestock convert feed to muscle more quickly, thus more rapid growth. This is because the use of some antibiotics can destroy certain bacteria in the gut (Ian Phillips *et al.*, 2004).

Recently many researchers have reported that the use of some antibiotics as livestock feed can cause antibiotics resistance issues in human which gives some negative consequences (Table 1.2). Murwani and Bayuardhi (2007) found antibiotics can increase abdominal fat in poultry and increase risk of heart disease in consumers. Thus, antibiotic was banned in 2006 by the European Union (Castanon, 2007) due to concerns of consumers on the health and environment (El-Husseiny *et al.*, 2002).

Table 1.2: Examples of direct and indirect effects of antibiotic use in food animals on human health

Direct effects	Indirect effects
Exposure to farm animals treated with antibiotics causes increased risk of resistant or infection in humans.	Transport of animals causes dispersion of resistant bacteria along route.
Consumption of food contaminated with antibiotic resistant bacteria causes diarrheal disease.	Resistant bacteria from animal waste used as fertilizer cause contamination of water supply and influence in human flora.
Consumption of antibiotic-containing meat products induces resistance in normal flora of the human gastrointestinal tract.	

Source: Landers *et al.*, (2012)

Many scientists searched for alternatives to antibiotic growth promoters (Langhout, 2000; Mellor, 2000; Wenk, 2000; Kamel, 2001). Spice herbs have received attention as possible growth promoter additives. Al-Kassie and Witwit (2010) discovered that some of these components have different active substances. Besides, many research those using spice herbs as feed additives in broiler diets can increase body weight and feed conversion ratio. An effect of antibiotics has led to research the use of black pepper as natural feed additives to improve poultry performance (Nikola, 2014).

In this experiment, the effect of use black pepper as natural feed additive on guinea fowl performances was investigated. This current study was performed in order to provide information on useful herbs as supplementation of natural feed in diets that can improve performance in guinea fowl production and also being beneficial to the consumer health due to ban on use of certain antibiotics which can give harmful residual effects. Use of spice herbs as feed additive does not give negative effects on animal health and welfare, quality of food of an animal origin, human health and the environment (European commission, 2003).

1.2 Objectives

To determine the effect of black pepper as natural feed additive as growth promoters in guinea fowl. The specific objective was:

1. To study dietary effect of black pepper on body weight gain and feed conversion efficiency of guinea fowl.
2. To determine the effect of black pepper on the morbidity and mortality of guinea fowl.

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