UNIVERSITI PUTRA MALAYSIA

GROWTH PERFORMANCE AND MEAT QUALITY OF BROILER CHICKENS FED WITH DIFFERENT LEVELS OF FERMENTED PALM KERNEL CAKE

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BY

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CERIFICATION FORM

This project entitled growth performance and meat quality of broiler chickens fed with different levels of fermented palm kernel cake is prepared by Muhamad Faisal Bin Mohd Asri and submitted to the Faculty of Agriculture in fulfilment 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 Abbreviation

PKC	Palm Kernel Cake
FPKC	Fermented Palm Kernel Cake
WHC	Water Holding Capacity
BW	Body Weight
BWG	Body Weight Gain
FCR	Feed Conversion Ratio
Kg/N	kilogram per Newton
T1	Treatment 1 (Basal Diet)
T2	Treatment 2 (Inclusion 5% PKC)
T3	Treatment 3 (Inclusion 10% PKC)
T4	Treatment 4 (Inclusion 15% PKC)
T5	Treatment 5 (Inclusion 20% PKC)
T6	Treatment 6 (Inclusion 5% FPKC)
T7	Treatment 7 (Inclusion 10% FPKC)
T8	Treatment 8 (Inclusion 15% FPKC)
T9	Treatment 9 (Inclusion 20% FPKC)

ABSTRACT

GROWTH PERFORMANCES AND MEAT QUALITY OF BROILER CHICKENS FED WITH DIFFERENT LEVELS OF FERMENTED PALM KERNEL CAKE

BY

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Supervisor

PROF LOH TECK CHWEN

Palm Kernel Cake (PKC) commonly found in Malaysia and has been categorized as agricultural by-product (ABP). PKC is widely used as ruminant feed in feed formulation. However, PKC is not very suitable for poultry due to its high fiber content. Solid State Fermentation (SSF) can help to degrade the crude fiber by using fermentation of PKC with selected bacteria. The objective of this work was to study the effect of feeding different levels of fermented PKC on growth performance and meat quality of broilers chicken from day old until 42 days of age. Birds were offered with starter and grower diets. All the chickens were fed with commercial diet for their starter period, whereas grower diet was offered from weeks 4 to 6 with different levels of PKC and Fermented PKC. The birds were distributed in a completely randomized experimental design with 9 treatments and 6 replicates. Each replicate consisted of 5 birds. PKC and fermented PKC were mixed in the diet of the birds according to the recommended nutrient requirements. All the birds were allocated to the following treatments: Treatment 1 (control), Treatment 2 (5% of PKC), Treatment 3 (10% of PKC), Treatment 4 (15% of PKC), Treatment 5 (20% of PKC), Treatment 6 (5% of Fermented PKC), Treatment 7 (10% of Fermented PKC), Treatment 8 (15% of

Fermented PKC) and Treatment 9 (20% of Fermented PKC). No significant differences (P>0.05) were found between the Treatments 1, 2 and 5 on their weight gain and feed conversion ratio but Treatments 7, 6 and 5 was significant lower (Pr>0.05) compared to another treatment. For water holding capacity, Treatment 5 were found higher while Treatment 2 were found the lowest reading compared to other treatments for cooking loss. While in drip loss Treatment 1 was significantly higher (Pr>0.05) compared to other treatment. Treatment 5 and Treatment 9 were significant higher in pH value while the meat temperature showing no significant different to each other. For the meat color, the L* from treatment 2 and Treatment 5 were not significant compared to each other, while A* for Treatment 6, Treatment 3, Treatment 8 and Treatment 7 were slightly lower value compared to another treatment. For B* Treatment 3 showing the highest reading and Treatment 7, Treatment 8 and Treatment 9 were slightly significant different. In conclusion, fermented PKC can promotes growth performances and enhances the meat quality of broiler chickens at certain percentages given especially in Treatment 7 inclusion of 15% of fermented PKC. Further studies to evaluate the growth performances of broiler chicken by increment of higher level Fermented Palm Kernel Cake in feed is recommended.

Key Words: ***Fermented PKC, Growth Performance, Feed Intake, Meat Quality, Broiler Chicken***

ABSTRAK

PRESTASI PERTUMBUHAN DAN KUALITI DAGING BROILER AYAM DIBERI FORMULASI TAHAP BERLAINAN ISIRONG KELAPA SAWIT YANG DITAPAI.

OLEH

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PENYELIA

PROF LOH TECK CHWEN

Kek Isirong Sawit biasa ditemui di Malaysia dan telah dikategorikan sebagai pertanian Undang-produk (ABP). PKC digunakan secara meluas sebagai makanan ruminan dalam formulasi makanan. Walau bagaimanapun, PKC tidak sesuai untuk ayam kerana kandungan serat yang tinggi. Solid State Penapaian (SSF) boleh membantu untuk merendahkan serat mentah dengan menggunakan penapaian PKC dengan bakteria dipilih. Objektif kajian ini adalah untuk mengkaji kesan ke atas prestasi pertumbuhan dan kualiti daging ayam daging ayam diberi makan dengan peratusan yang berbeza Cake Kernel ditapai dari umur sehari sehingga 42 hari umur. Burung-burung yang telah ditawarkan dengan permulaan dan penanam diet. Semua ayam diberi makan dengan diet komersial untuk tempoh permulaan mereka, manakala diet penanam telah ditawarkan dari minggu 4-6 dengan pelbagai peringkat PKC dan Ditapai PKC. Burung-burung yang telah diedarkan dalam reka bentuk eksperimen yang sama sekali rawak dengan 9 rawatan dan 6 ulangan. Setiap ulangan terdiri daripada 5 burung. PKC dan Ditapai PKC telah bercampur dalam diet burung mengikut formulasi yang disarankan. Semua burung

akan diperuntukkan untuk rawatan yang berikut terdiri daripada diet basal, Rawatan 1 (kawalan), Rawatan 2 (5% daripada PKC), Rawatan 3 (10% daripada PKC), Rawatan 4 (15% daripada PKC), Rawatan 5 (20% daripada PKC), Rawatan 6 (5% daripada Ditapai PKC), Rawatan 7 (10% daripada Ditapai PKC), Rawatan 8 (15% daripada Ditapai PKC) dan Rawatan 9 (20% daripada Ditapai PKC). Tiada perbezaan yang signifikan (P> 0.05) didapati antara Rawatan 1, 2 dan 5 pada berat badan dan makanan nisbah penukaran mereka tetapi Rawatan 7, 6 dan 5 adalah lebih rendah penting daripada (P> 0.05). Untuk keupayaan memegang air, Rawatan 5 didapati lebih tinggi manakala Rawatan 2 didapati bacaan terendah berbanding rawatan lain untuk kehilangan memasak. Walaupun kehilangan titisan Rawatan 1 adalah jauh lebih tinggi (Pr> 0.05) berbanding dengan rawatan lain. Rawatan 5 dan rawatan 9 adalah signifikan lebih tinggi dalam nilai p H manakala suhu daging yang menunjukkan yang berbeza signifikan antara satu sama lain. Dalam warna daging, L itu dari dalam rawatan 2 dan Rawatan 5 tidak ketara berbanding dengan satu sama lain, manakala A * Rawatan 6, Rawatan 3, Rawatan 8 dan Rawatan 7 adalah nilai yang lebih rendah sedikit berbeza ketara. Untuk B * Rawatan 3 menunjukkan bacaan tertinggi dan Rawatan 7, Rawatan 8 dan 9 Rawatan adalah berbeza sedikit ketara. Kesimpulannya, Ditapai PKC sedikit boleh menggalakkan persembahan pertumbuhan dan meningkatkan kualiti daging ayam daging peratusan tertentu diberikan. Kajian lanjut untuk menilai prestasi pertumbuhan ayam daging oleh kenaikan tahap lebih tinggi Ditapai dedak isirong sawit dalam makanan adalah disyorkan.

Kata Kunci: Ditapai PKC, Pencapaian Pertumbuhan, Pengambilan Makanan, Daging Kualiti, Broiler Ayam

CHAPTER 1

INTRODUCTION

Palm kernel Cake (PKC), as poultry feed ingredient is gaining in importance nowadays in poultry industry. The characteristics and the nutritional value in the PKC makes this raw material more economical and further may reduce environment pollution. It is known that the PKC is one of the potential ingredients of the poultry feed. However, even though PKC has a lot of benefits but the usage is limited due to its high fiber contents, low palatability, poor amino acid balance and low digestibility (Iluyemi et al., 2006). These are coupled with some anti-nutritional properties like mannan, galactomannan, xylan, and arabinoxylan (Sundu and Dingle, 2002). It is expected that the microbial enzymes will breakdown β-mannan (which is abundant fiber in PKC) into simple sugars during solid state fermentation (SSF). This may be able to eliminate the anti-nutritional factors and increase the digestible sugars in PKC which can then be fully absorbed and metabolized by the chickens.

Malaysia on annual basis imported over 2 million ton of protein supplement, mainly soybeans and fish meal (Abu Hassan *et al*,1996). This shows that Malaysia basically have its own raw material source that will reducing importation of large amount of raw material from other countries. As this happens, this will make the meat more affordable and cheaper.

Many studies have been carried out to enhance the nutritive value of PKC by biological, chemical and physical method. One of the methods to improve the nutritive

value in PKC is by solid state fermentation (SSF). The definition of SSF basically is the normal fermentation that involving the cultivation of outside microorganisms of fungus on a solid substrate such as PKC, grains, rice or wheat brans. SSF is carried out in presence of moisture in order to ensure the fungus or any microorganisms will grow and produce some other enzymes (Pandey *et al*, 1994). The function of the enzymes from SSF will degrade indigestible lignin and increase protein content ok PKC (Illuyumi *et al*, 2006).

1.1 RESEARCH PROBLEM

In poultry industries, more than 75% of production cost comes from feed cost. Furthermore, the same sources of the feed are also being consumed by human thereby existed of some competition between animals and human for protein sources. Feed ingredients for poultry such as corn, soybeans and fishmeal are mostly imported. Some alternatives are needed to reduce the cost of feed, such as agro-industrial by product such as PKC, oil palm frond, sago and so on.

1.2 SIGNIFICANCE OF STUDY

Improvement in the nutritive value of PKC can increase the usage of PKC in poultry feed, thus we can reduce importation of feed ingredients and may reduce the cost of feed in poultry production. The more understanding of PKC used will enhance our animal production industry and totally will increase our country meat exportation. Farmer will be exposed to new method on how to formulate meal ration that can improve the quality of meat since the animal consume the best total meal ration. Besides, it also helps our industry to be more creative and innovative in different ways.

1.3 RESEARCH HYPOTHESIS

Fermented PKC will give more benefit in meat quality and enhance the growth performances in broilers. The correct percentages of fermented PKC given will totally reward the best result for meat quality and broilers growth performance.

1.4 OBJECTIVES

To determine the biological effects of substitute fermented PKC in broiler diets on broiler chicken's performance.

The specific objectives:

1) To evaluate growth performances of broilers offered different percentages of fermented PKC.

2) To evaluate the effects of fermented PKC on meat quality of broiler chickens.

CHAPTER 7

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