Utilization of Local Thai Herbs on Productive Performances of Native Crossbred Chickens

Narumon Somkuna¹*, Jarous Sawangtap¹, Damrong Kittichaisri, Naritikorn Chantnew¹, Uppataporn Jumsil¹, Marut Tip-aksorn¹ and Eakkasit Somkuna²

ABSTRACT: The objective of this study was to compare the effect of supplementation of three kinds of local Thai herbs which were white kwao krue (Pueraria mirifica), turmeric (Curcuma longa L.), and kariyat (Andrographis paniculata) in single form and mixed in different level on growth performance and carcass percentage of native crossbred chickens. One hundred and ninety two native crossbred chickens at 21 day-old and average weight was 250±54.22 grams were used in this study. The chickens were received 8 treatment diets with 4 replications and each replication was consisted of 6 birds. The experimental diet were control diet (T1) without supplementation, T2 was diet which supplemented with white kwao krue 1%, T3 was diet which supplemented with turmeric 0.1%, T4 was diet which supplemented with kariyat 0.2%, T5 was diet which supplemented with white kwao krue 1% and turmeric 0.1%, T6 was diet which supplemented with white kwao krue 1% and kariyat 0.2%, T7 was diet which supplemented with turmeric 0.1% and kariyat 0.2%. T7 was diet which supplemented with white kwao krue 1% and turmeric 0.1%, and kariyat 0.2%. The experiment was conducted for 12 weeks. Data of average daily gain (ADG), Feed conversion ratio (FCR), and carcass percentage were collected for data analysis by using ANOVA and compared the average by Duncan’s New Multiple Range test (DMRT). The results have shown that the chickens that received dietary supplemented with three kinds of Thai herbs in different level showed significantly different in average daily gain (P<0.05). By T5 revealed highest average daily growth as 16.31 gram per day by there was no significantly different from T7 (15.45 gram per day). FCR in all treatment was not different (P>0.05) while T7 showed the best result as 2.78. Carcass percentage of T7 was 88.29%. In conclusion, the diet which supplemented with turmeric 0.1% and kariyat 0.2 % showed the best effect on performance performance and carcass of native crossbred chickens.

Keywords: white kwao krue (Pueraria mirifica), turmeric (Curcuma longa L.), kariyat (Andrographis paniculata) (Burm. F.). Nees), productive performance, native crossbred chickens

Introduction

Thai native chicken is commercially produced for consumption because it can be raised with low production costs under the farming of a backyard. It has high tolerance to tropical diseases. Moreover, its meat has a unique taste and texture, is regard as a delicacy. The selling price of the meat is two or three times higher than that of commercial broiler (Wattanachant et al. 2004). Disadvantage of native chicken is slow growing that can take time up to 12-16 weeks of raising.

In Thailand, broiler chicken production plays an important in both industrial and farmer level. To improve productive performance of broiler, some of producers use antibiotics growth promoters (AGPs). The use of antibiotics in poultry feed as a growth promoters is beneficial in improvement of production parameters and disease prevention. However the antibiotic led to the increasing resistance of pathogens to antibiotics and accumulation of antibiotic residues in animal products and in the

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environment (Alloui et al. 2014). Windisch et al. (2007) also stated that antibiotic feed additives have caused public concern due to the potential of residues in animal products such as milk and meat. At present, animal nutritionists have been interested in evaluating the potential of natural antimicrobials, such as herbs and plant extracts, which have been used for centuries for various purposes in human diets. In addition, there is now a world tendency to produce “natural” food which is free from chemicals, the so called “Green Products”. Thus, there are many researches and attempts to use medicinal plants in broiler production instead of antibiotics have been made by both farmers and researchers. Odomelam et al. (2013) stated that herbs and spices and plant derivatives used in animal feeding as feed additives are referred to as phytogenic feed additives (PFA). Some of herbs and spices are widely used as antibacterial agents, improved the palatability of feed, enhance activities of digestive enzymes and nutrient absorption.

Plant herbs such as turmeric (Curcuma longa), kariyat (Andrographis paniculata (Burm.F) Nees), and white kwao krue (Pueraria mirifica) are tropical plant native to southern and southeastern tropical Asia. Turmeric (Curcuma longa) has the main yellow bioactive substances isolated from the rhizomes of Curcuma are curcumin. Curcumin is known to have potent antioxidative, anti-inflammatory, and anti-carcinogenic activities (Wei et al. 2010). Turmeric has been widely used in poultry feed as the study of Durrani et al. (2006) who investigated the effect of different levels of Turmeric on the overall performance of broiler chicks. They concluded that the used of Turmeric as feed additive at level of 0.5% enhances the overall performance of broiler chicks. Kariyat (Andrographis paniculata), it is a well known medicinal plant commonly used in humans as an immune system booster. It is also very widely used in Asian countries such as China, Indonesia, Malaysia and Thailand that used for healing common colds, inflammations and diarrhea. Its main active compound is andrographolide and aditerpenoid lactone (Tipakorn. 2002). White Kwao Krue (Pueraria mirifica, Airy Shaw & Suvatabandhu) is an indigenous herb of Thailand, known in Thai as “Kwao Kruea” or “Kwao Krue Kao” (White Kwao Kruea). It belongs to the Family Leguminosae, subfamily Papilionoideae or the soy, bean & pea subfamily. The plants are commonly found in abundant in the forests in the north, the west and the northeast of Thailand. Active principles compound in this plant are found in the tuberous root. White kwao krue contains high isoflavones, the most interesting phyto-estrogens. White Kwao Krue contains a valuable phytoestrogen named miroestrol. Miroestrol is similar to the safest human estrogen estriol. Miroestrol is 3,000 times stronger than the estrogenic activity exhibited by soy isoflavones (genistein) and 1000 times that of red clover. In addition to miroestrol, White Kwao Krue contains substantial amounts of other phytoestrogens including daidzein, genistein, puerarin, and mirificin. These three local Thai herbs have been searched to be used in poultry feed as growth promoters (Somkuna et al. 2011; Somkuna et al. 2012; Maiyenklang et al. 2012; Somkuna et al. 2013). Most of researches based on single form of using these herbs in poultry diet. Therefore the aim of this study was to compare the effect of supplementation of three local Thai herbs which were white kwao krue (Pueraria mirifica), turmeric (Curcuma longa L.) and kariyat (Andrographis paniculata (Burm. F). Nees) in single form
and mixed in different level on growth performance and carcass percentage of native crossbred chickens.

**Materials and Methods**

One hundred and ninety two native crossbred chickens at 21 day-old and average weight was 250±54.22 grams were used in this study. The chickens were received 8 treatment diets with 4 replications and each replication was consisted of 6 birds. The experimental diet were control diet (T1) without supplementation, T2 was diet which supplemented with white kwao krue 1%, T3 was diet which supplemented with turmeric 0.1%, T4 was diet which supplemented with kariyat 0.2%, T5 was diet which supplemented with white kwao krue 1% and turmeric 0.1%, T6 was diet which supplemented with white kwao krue 1% and kariyat 0.2%, T7 was diet which supplemented with white kwao krue 1% and turmeric 0.1%, and kariyat 0.2%. T7 was diet which supplemented with white kwao krue 1% and turmeric 0.1%, and kariyat 0.2%. The experiment was conducted for 12 weeks. Data of average daily gain (ADG), Feed conversion ratio (FCR), and carcass percentage were collected for data analysis by using ANOVA and compared the average by Duncan’s New Multiple Range test (DMRT).

**Result and Discussion**

The results have shown that the chickens that received dietary supplemented with three kinds of Thai herbs in different level showed significantly different in average daily gain (P<0.05). By diet which supplemented with white kwao krue 1% and turmeric 0.1%, revealed highest average daily growth as 16.31 gram per day by there was no significantly different from T7 (diet which supplemented with white kwao krue 1% and turmeric 0.1%, and kariyat 0.2%) (15.45 gram per day). These finding were consistent with the work of Somkuna et al. (2011) who found that dietary supplementation with 1% of white kwao krue affected growth performance of native chicken. FCR in all treatment was not different (P>0.05) while T7 showed the best result of FCR as 2.78 and carcass percentage of T7 was 88.29% as shown in Table 1. Result of carcass percentage of native chicken that received mixed herbs (T7) showed the highest carcass percentage, this result was consistent with the work of Poonpipat et al. (2000) who found that broiler received kariyat at 0.4% showed the better carcass percentage and carcass acceptability by the consumer.

**Conclusion**

The diet which supplemented with turmeric 0.1% and kariyat 0.2 % showed the best effect on productive performance and carcass percentage of native crossbred chickens.

**Acknowledgement**

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**References**


Table 1  Effect of supplementation of three kinds of local Thai herbs which were white kwao krue (*Pueraria mirifica*), turmeric (*Curcuma longa* L.), and kariyat (*Andrographis paniculata* (Burm. F.). Nees) in single form and mixed in different level on productive performance and carcass percentage of native crossbred chickens

<table>
<thead>
<tr>
<th>Produtive performance</th>
<th>Dietary Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
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<tbody>
<tr>
<td></td>
<td>Level of Supplemen</td>
<td>control</td>
<td>White kwao krue 1%</td>
<td>Turmeric 0.1%</td>
<td>Kariyat 0.2%</td>
<td>White kwao krue 1% and turmeric 0.1%</td>
<td>White kwao krue 1% and kariyat 0.2%</td>
<td>White kwao krue 1% and turmeric 0.1% and kariyat 0.2%</td>
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<tr>
<td>Growth Rate (gram per day)</td>
<td>Week 3 - 12</td>
<td>14.97&lt;sub&gt;ab&lt;/sub&gt;</td>
<td>14.74&lt;sub&gt;ab&lt;/sub&gt;</td>
<td>14.49&lt;sub&gt;a&lt;/sub&gt;</td>
<td>15.61&lt;sub&gt;bcd&lt;/sub&gt;</td>
<td>16.31&lt;sub&gt;d&lt;/sub&gt;</td>
<td>15.98&lt;sub&gt;cd&lt;/sub&gt;</td>
<td>15.45&lt;sub&gt;bcd&lt;/sub&gt;</td>
<td>15.25&lt;sub&gt;abc&lt;/sub&gt;</td>
</tr>
<tr>
<td>Feed conversion ratio (FCR)</td>
<td>Week 3 - 12</td>
<td>3.13&lt;sub&gt;b&lt;/sub&gt;</td>
<td>3.68&lt;sub&gt;d&lt;/sub&gt;</td>
<td>3.62&lt;sub&gt;d&lt;/sub&gt;</td>
<td>3.30&lt;sub&gt;c&lt;/sub&gt;</td>
<td>2.88&lt;sub&gt;abcd&lt;/sub&gt;</td>
<td>2.86&lt;sub&gt;b&lt;/sub&gt;</td>
<td>2.78&lt;sub&gt;a&lt;/sub&gt;</td>
<td>2.95&lt;sub&gt;ab&lt;/sub&gt;</td>
</tr>
<tr>
<td>Carcass Percentage</td>
<td>Week 12</td>
<td>81.88&lt;sub&gt;a&lt;/sub&gt;</td>
<td>80.23&lt;sub&gt;a&lt;/sub&gt;</td>
<td>80.00&lt;sub&gt;a&lt;/sub&gt;</td>
<td>80.25&lt;sub&gt;b&lt;/sub&gt;</td>
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<td>88.29&lt;sub&gt;b&lt;/sub&gt;</td>
<td>87.76&lt;sub&gt;b&lt;/sub&gt;</td>
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<sub>abc</sub> mean within row with common superscript differ significant (P<0.05)