# Development of Broiler Chicken Feed Using Black Soldier Fly Larvae *(Hermetia illucens)* (BSFL) as Protein Source

**By**

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# DECLARATION

I hereby declare that the work embodied in here is the result of my own research except for the excerpt as cited in the references.

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| | |
|---|---|
| BSFL | Black Soldier Fly Larvae |
| GM | Genetic Modified |
| FCR | Feed Conversion Ratio |
| DCP | Dicalcium phosphate |
| ME | Metabolizable Energy |
| GE | Gross Energy |
| AAS | Atomic Absorption Spectroscopy |
| CP | Crude Protein |
| Na | Sodium |
| Ca | Calcium |
| Meth | Methionine |
| Cys | Cysteine |
| N | Nitrogen |
| VA | Volume of acid used |
| EE | Ether Extract |
| NFE | Nitrogen Free Extract |
| MC | Moisture Content |
| DM | Dry Matter |
| STE | Standard Error |

# Development of Broiler Chicken Feed Using Black Soldier Fly Larvae (Hermetia illucens) (BSFL) as Protein Source.


## ABSTRACT

The expand of poultry industry especially for broiler chicken due to gaining in white meat consumption by human give a good effect to poultry feed manufacturer. However, in poultry industry, the price of raw material become the main problem especially the price of protein source is. Due to this matter, the aim for this study was to determine the optimum inclusion using Black Soldier Fly Larvae (Hermetia illucen spp) (BSFL) as protein source to substitute or lessen the use of fish meal and soybean. In this study, the feed formulation for male Cobb sp. breed chicken was done using Microsoft Excel which was equipped the nutrient data for each ingredients. The feed was formulated according male Cobb sp. requirement with different inclusion of defatted BSFL which were 0%, 20%, 40% and 60% for every phase starter, grower and finisher. The feed was formulated in mash form for starter and pelleted for grower and finisher to enhance the palatability. The cost and composition of ration formulations were recorded. All 12 ration formulation were then analyzed to identify the nutrient and chemical composition content. The data was analyzed using one way Anova method and Tukey test. For starter, treatment 40% was the best formulation as it had the highest ME compared to others while for grower, treatments 20% was the closest ration with the recommendation same goes with treatment 60% that has highest ME which is good for finisher in order to gain weight and carcass. For cost benefit analysis, treatment 20% has the best cost benefits among all.



***Keywords:*** *Black soldier Fly Larvae, Feed formulation, Feed cost, Nutrient requirement*

# Pengembangan Makanan Ayam Pedaging Menggunakan Larva Lalat Askar Hitam Sebagai Sumber Protein


## ABSTRAK

Perkembangan industri unggas terutamanya untuk ayam pedaging yang disebabkan oleh penggunaan daging putih oleh manusia memberi kesan yang baik kepada pengeluar makanan ternakan ayam. Walau bagaimanapun, dalam industri unggas, harga bahan mentah menjadi masalah utama terutama harga sumber protein. Oleh itu, tujuan kajian ini adalah untuk mengetahui kemasukan optimum menggunakan Larva Lalat Askar Hitam (*Hermetia illucen spp*) (BSFL) sebagai sumber protein untuk menggantikan atau mengurangkan penggunaan mil ikan dan mil soya. Dalam kajian ini, rumusan suapan untuk ayam jantan *Cobb sp*. telah dilakukan dengan menggunakan Microsoft Excel yang dilengkapi data nutrien untuk setiap bahan. Rumusan makanan telah dibuat mengikut keperluan nutrient ayam jantan *Cobb sp.* dengan kemasukan berlainan BSFL iaitu 0%, 20%, 40% dan 60% untuk setiap fasa permulaan, pembesaran dan penyudahan. Makanan telah diformulasikan dalam bentuk dedak untuk pemula dan palet untuk fasa pembesaran dan penyudahan untuk meningkatkan penerimaan makanan. Kos dan komposisi formulasi catuan telah direkodkan. Semua 12 rumusan makanan kemudian dianalisis untuk mengenal pasti kandungan komposisi nutrien dan kimia. Data juga dianalisis menggunakan analisis statistik. Untuk permulaan, rawatan 40% adalah formula terbaik kerana ia mempunyai ME tertinggi berbanding dengan yang lain manakala untuk makanan fasa pembesaran, rawatan 20% adalah yang paling hampir dengan nutrient cadangan yang diperlukan. Sama juga rawatan 60% yang mempunyai ME tertinggi yang baik untuk fasa penyudahan untuk meningkatkan berat badan dan karkas. Untuk analisis manfaat kos, rawatan 20% mempunyai manfaat kos terbaik di kalangan semua.



***Keywords:*** *Larva Lalat Askar Hitam, Formulasi Makanan, Kos Makanan, Keperluan Nutrien*