Formulated Botanical Dewormer for Different Strains of Free-Range Chickens and Raised in Different Locations

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Abstract

The study was conducted from June to November 2016 with the aim of determining the efficacy of the formulated botanical dewormer using two different strains (Darag and Sasso) of free-range chickens raised at Porog, Pototan, Iloilo; Aglalana, Passi City; and Capiz State University, Dumarao, Capiz. One hundred eighty experimental birds were used in the study. Efficacy was determined in terms of egg per gram count (epg) of roundworms through quantitative and qualitative examination using the sugar flotation technique before and after treatment of the formulated botanical dewormer. The average post treatment epg count was determined on the 7th, 14th, 21st and 28th after the administration of the botanical dewormer with the recommended dosage of 2 gms/kg bw. Redeworming was done two weeks after the first administration. Data gathered were analyzed using a 2 x 3 factorial in Randomized Complete Block Design (RCBD) using Analysis of Variance. Results revealed that there was no significant difference on the efficacy of the formulated botanical dewormer between Darag and Sasso strains. However, there was a highly significant difference between the three different locations. Native chicken raised at Porog, Potatan, Iloilo had a higher percent reduction of epg compared to those birds raised in Passi City and Dumarao. There was an interaction between the strain and location where the birds are raised.

Keywords: Botanical Dewormer, Darag, Free-range Chickens, Sasso

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Introduction

Free range farming is the framing system where birds are in a non-stressed environment. They are not crowded, have a natural diet of grains, forage, and bugs and have plenty of fresh air and sunlight (Poole, 2016). Free range chicken farming now days has gained popular all over the country due to the increasing demand of poultry meat. Most common strain of chickens that were raised in free range farming is native chickens and some dual purpose breed like Sasso chickens.

Native chicken meat has always been preferred by consumers over that of commercial broilers due to its unique taste, distinct flavor and texture, presence of nutraceutical compounds (functional food), and lower fat content (PCAARRD, 2016). Native chickens being commonly raised in the countryside can adapt, survive and reproduce under adverse conditions with marginal care and low production inputs (Lopez et al., 2014).

Sasso chicken is a dual type of chicken which originated in Southeast Asia. It is popular village chicken producing more than 200 eggs per year. They are easy to manage, semi scavenging, strong diseases resistance, low vet costs, and taste as local chickens (de Solferino, 2016).

Despite the fact that the two breeds mentioned were resistant to diseases, because of the unpredictable changes in the environment, they were also vulnerable to a certain disease. According to Pińol (2016) native chicken is also vulnerable to diseases, are poor egg producers, slow growers and do not carry much meat mass in their body. Parasitism is one of these diseases.

Parasitism can be a cause of death, decrease of egg production, growth performanceof the birdsand also increase morbidity and mortality rates (Venus, 2009). Parasites are a major cause of disease and production loss in livestock, frequently causing significant economic loss and impacting on animal welfare. In addition to the impact on animal health and production, control measures are costly and often time-consuming. A major concern is the development of resistance by worms, lice and blowflies to many of the chemicals used to control them (Livestock Parasite (n.d.)).

Drugs and live vaccines are the control measures used recently in the poultry farms (Abbas, 2012). But development of drug resistance in strains in the field and the withdrawal period for these drugs prior to slaughter necessitate the exploration of alternative methods (Chandrakesan et al., 2009).

One of these alternative methods is with the use of ethnobotanical dewormer. The use of formulated ethnobotanical plants such as ipil-ipil (Leucaena leucocephala, Lam. de wit) seeds and betel nut (Areca catechu L.) with anthelmintic components is already used to expel and kill internal parasites.

Ipil-ipil (Leucaena leucocephala, Lam. de wit) is a deep-rooted tree with bi-

pinnate leaves, lanceolate leaflets and yellow white flowers in long stalk heads. It is a perennial summer growing plant. The leaves and seeds contain the glucoside mimosine. It has anthelmintic activity (IIRR, 1994 as cited by Ozaraga et al., 2015).

Betel nut (*Areca catechu* L.) commonly known as Bunga, has an erect trunk, solitary up to 25 m high and mark with annular scars. Mature seeds are vermifuge. Powdered nuts are used as anthelmintic. The nuts contain arecoline which is veterinary anthelmintic (De Padua et al., 1999 and Meyer Jones et al., 1977 as cited by Ozaraga et al., 2015). Several studies has been made and conducted on the use of formulated botanical dewormer to Darag native chicken and found it effective and comparable with the commercial dewormer at a dosage of 2g/kg body weight.

This study aimed to test the efficacy of the formulated botanical dewormer in free-range chickens (Darag and Sasso) raised in different locations. Specifically it aimed to determine the efficacy of formulated botanical dewormer in terms of percent reduction of ova of the intestinal roundworms egg per gram count; determine the efficacy of formulated ethonobotanical dewormer in two different strains of chicken; compare the efficacy of formulated botanical dewormer in chicken raised in three different locations and determine if there is an interaction on the efficacy of botanical dewormer between strains and locations.

Materials and Method

One hundred-eighty undewormed grower chickens aging from one to four months raised in Porog, Pototan, Iloilo; Aglalana, Passi City and Capiz State University, Dumarao, Capiz, with two different strains (Darag and Sasso)were used as experimental animals. Microscope for qualitative and quantitative examination of the parasites, cooler and ice for preserving fecal samples upon transportation to the laboratory site, gloves to avoid contamination of the samples, fecal cups, strainers, spatula, plastic cellophanes, weighing scale, beaker, test tubes, hot plate, test tube racks, glass slides, cover slips, stirring rod, sugar solution, necropsy tools, laboratory gown, notebook, ball pen, formulated botanical dewormer and a digital camera for documentation.

Experimental Treatments

The experimental animals were equally divided into; two strains (Darag and Sasso), at three different locations were namely 1) Porog, Pototan, Iloilo; 2) Aglalana, Passi City; and 3) Capiz State University, Dumarao, Capiz.

Experimental design and lay-out

A 2 x 3 factorial experiments in Randomized Complete Block Design (RCBD) was used in the study. One hundred eighty experimental birds with two strains (Darag and Sasso) were randomly distributed within three different location (60 birds per location) having a total of six treatments; replicated three times, with 10 birds per

replicate. Randomization was done using the draw-lots scheme and the different treatment combinations.

Table 1.0 Mean egg per gram count of roundworms in Darag and Sasso strains at 3 different locations before and after ethnobotanical administration.

Treatment Combinations	Pre-treatment EPG Count	Post-Treatment EPG Count
A1B1 (Darag,Dumarao)	2667	816.67
A1B2 (Darag, Passi)	1700	433.33
A1B3 (Darag,Pototan)	2867	350
A2B1 (Sasso,Dumarao)	1433	250
A2B2 (Sasso,Passi)	1300	583.33
A2B3 (Sasso,Pototan)	2133	241.67

Management Practices

Preparation of house and ranging area. A total of 1,800 square meters ranging area was used at 600 square meters per location at 100 square meters per 10 birds. Each ranging area was separated with a nylon fence. Each of the compartments was provided with shade house made up of bamboo with galvanized iron sheet as roofing. Feeders and waterers were provided and cleaned daily.

Administration of formulated botanical Dewormer and Feeding. Ad libitum feeding management was implemented during the entire study. Grower feeds were used as supplemental feeds. A single dose administration of Formulated Botanical Dewormer was done in the morning at a dosage of 2 grams/kg bw by mixing it with a small amount of feeds to make sure it were consumed by the birds. Chickens were then redewormed after two weeks from the first administration of ethnobotanical dewormer.

Provision of water. The experimental birds were supplied with clean water daily where the waterers were maintained cleanthroughout the duration of the study. To ensure normal growth and development, vitamins and electrolytes soluble powder were given during stressful conditions.

Gathering of Data

The experimental birds were initially screened for intestinal parasites. Pre-treatment egg count was determined by getting the average egg per gram (EPG) count three days before the administration of the formulated ethnobotanical dewormer.

Fecal samples were collected directly in the anus of the birds to prevent contamination of the fecal sample. Collection was done early in the morning, placed in a plastic container, labeled and placed in a cooler with ice to preserve the hatching

of parasites egg and deterioration of the samples.

The samples were brought to the laboratory of the College of Veterinary Medicine Teaching Hospital for fecalysis. Examination was done approximately at a minimum of three hours after the actual collection of the fecal sample. Quantitative examination and qualitative examination was done using the sugar floatation technique.

Egg per gram count

The data was based on the counted ova of the different species of the intestinal roundworms from the experimental birds. Post treatment fecal examination was done on the 7th, 14th, 21st, and 28th day after the first administration of ethnobotanical dewormer.

Statistical Tools and Analysis

Percent reduction of intestinal worms' ova was obtained using the formula:

$$\text{Percent reduction} = \frac{A - B}{A} \times 100$$

Where: A = Pre-treatment number of intestinal parasite ova

B = Post-treatment number of intestinal parasite ova

The statistical analyses of the data gathered were analyzed and statistically interpreted using a 2 x 3 factorial in Randomized Complete Block Design (RCBD).Data were analyzed using analysis of variance.The result was interpreted at 5% and 1% levels of significance.

Results and Discussion

The mean egg per gram count of roundworms in Darag and Sasso strains at three different locations before and after ethnobotanical administration was determined through fecalysis (sugar floatation technique) is presented in Table 1.0. This datais used to determine the reduction of egg per gram count after the administration of the formulated ethnobotanical dewormer. Statistical analysis, however, revealed that there was no significant difference interms of percent reduction of egg per gram count in roundworms of chickens between Darag and Sasso strains.This means that theformulated botanical dewormer has the same effectregardless of the strains of chicken. However, there was a highly significant difference ($P < 0.01$) in terms of location where the chickens are raised. This may due to the degree of infestation in an area, birds raised in Pototan were more heavily infested with roundworms (as seen in pre-treatment count,) thus having a higher percentage reduction of egg per gram roundworm ova. There was an interaction on the effectivity of the ethnobotanical

dewormer between the strain and location where the chicken is raised. Like those Sasso chickens raised in Pototan had the highest percent reduction of egg per gram count of roundworms having the mean of 88.67 while those Sasso chickens raised in Passi had the lowest percent reduction of egg per gram count of roundworms with the mean of 55.13. Those Darag chickens raised in Pototan also had the highest percent reduction of egg per gram count of roundworms with the mean of 87.79 while the Darag chickens raised in Dumaro had the lowest percent reduction of roundworms with the mean of 69.38. These circumstances may due to a certain location have a higher degree of infestation of parasites thus having a higher percent reduction of parasite egg per gram count.

Table 2.0 Percent reduction of egg per gram count of roundworms using the formulated ethnobotanical dewormer in Darag and Sasso at 3 different locations.

Treatment Combinations	Block 1	2	3	Total	Mean
A1B1 (Darag, Dumarao)	64	66	78	208	69
A1B2 (Darag, Passi)	84	68	71	223	74
A1B3 (Darag, Pototan)	91	88	84	263	88
A2B1 (Sasso, Dumarao)	77	80	89	247	82
A2B2 (Sasso, Passi)	54	44	67	165	55
A2B3 (Sasso, Pototan)	96	89	82	268	89

Table 2.1 Analysis of variance on the efficacy of formulated botanical dewormer at different strains and locations.

VS	DF	SS	MS	F
Factor1-F1	1	14.22222	14.22222	0.2351 ns
Factor2-F2	2	1683.11111	841.55556	13.9100 **
Int. F1xF2	2	789.77778	394.88889	6.5271 *
Treatments	5	2487.11111	497.42222	8.2219 **
Error	12	726.00000	60.50000	
Total	17	3213.11111		

** Significant at a level of 1% of probability ($p < .01$)
* Significant at a level of 5% of probability ($.01 =< p < .05$)
ns non-significant ($p >= .05$)

Conclusions

The formulated ethnobotanical dewormer is both effective to Darag and Sasso strains. Its effectivity is comparable to both strains. The percent reduction of egg per gram count vary in location where the chickens raised in Pototan has a higher percent reduction compared to Passi City and Dumarao. These may due to a higher degree of infestation of parasites in Pototan. The higher the degree of infestation the higher is its percent reduction. Formulated ethnobotanical dewormer can be used to other strains of chicken at a recommended dose of 2g/kg bw.

Recommendations

Utilize the Formulated Ethnobotanical Dewormer to all strains of free-range chickens for it has a comparable effectivity with the commercial dewormer but of lower cost and conduct other studies using other ethnobotanical anthelmintics.

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