



HAEMATOLOGICAL RESPONSE OF WEANERS PIGS FED WITH GRADED LEVELS OF WATER HYACINTHS (*Eichornia crassipes*) AS FEED SUPPLEMENT

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ABSTRACT

A feeding trial to investigate the haematological profile of weaner pigs fed water hyacinths (*Eichornia crassipes*) as a way of controlling its environmental menace was conducted using Landrace weaners of both sexes weighing 10-12kg. The study was carried out at Patiko Farms Nigerian Limited, located at Bomadi Local Government Area of Delta State, and this lasted for ten weeks with two weeks stabilization period. Four experimental diets were formulated with group A serving as the control and groups B, C and D containing, 10%, 20% and 30% SBM replaced with water hyacinth respectively. The weaners were randomly assigned to four dietary treatment groups designated A, B, C and D respectively in a Complete Randomization Experimental Design (CRD). All the haematological parameters measured revealed no significant effects from the treatment ($P > 0.005$). It was therefore concluded that water hyacinth (*Eichornia crassipes*) can be included in the ration of weaners up to 30% inclusion to replace Soya bean meal as a way of controlling its environmental menace.

KEY WORDS: Haematology, Water Hyacinth, Feed Supplement, Weaner Pigs.

INTRODUCTION

Water hyacinth (*Eichornia crassipes*) is a common feature in many fresh and marine water bodies in Nigeria particularly in the Niger Delta. Often, this plant covers large proportion of the water bodies thereby reducing the utilization potential (World Bank 1997). The plant is capable of producing large standing crops in a relatively short time; it is capable of producing about 150-200 tons/hectare/year (Goppal, 1997; Dymond, 2002). The nutritional value of water hyacinth varies depending on the age, part of the plant, nutritional status and contamination of the surrounding water body (Dymond, 2002). Blood circulates in the vessels of man and animals, transporting oxygen from respiratory organs to body cells, carrying nutrients to the tissue cells and excretory products through kidney, guts, lungs, liver and skin, and maintaining haemostatic (Akinmutimi, 2002). Haematological Parameters are those cells or factors in the blood whose status is used as a baseline for assessing degree of well being of an animal. Therefore, the importance of determining haematological status of farm animals has long been established by several authors (Cole 2003; Ajuogu *et al.*, 2010; Wekhe and Njoku, 2001; Owen and Amakiri, 2011). It has also been reported that certain haematological factors can be associated with certain production traits. For examples, it has been established that high packed cell volume (PCV) and high haemoglobin content (HB) are associated with high feed conversion efficiency (Mitruka and Rawnsley 1997) while high percentage of white blood cells especially lymphocytes are associated with the ability of the chicken to perform well under very stressful conditions. Consequently, the effects of and feed ingredients on the haematological factors of

farm animals are of immense assistance in deciding whether or not such a feed ingredient should be used as livestock feed stuff. Pigs are monogastric animals which belong to the species *Sus scrofa*. One of the advantages of swine production is the ability to efficiently convert unconventional plants and plant by-products to high quality meat. In the sub-Saharan region particularly Nigeria, one of the factor working against profitable swine production is the increasing competition between man and animals in consumption of food stuff and consequent high cost of the conventional feed ingredients for animal's production. The present high cost of the conventional feed ingredients present a need to investigate alternative, cheaper but high quality feed ingredients for the swine and poultry industry (Amefule and Obioha, 1998). The long term viable solution to the water hyacinth menace is to properly utilize it as a resource by converting it into a useful feed ingredient in livestock nutrition. The technique to convert it to animal feed offers a positive hope for a viable long-term control measure without polluting the environment. Therefore, the objectives of this study is to evaluate the influence water hyacinth (*E. Crassipes*) on the haematological indices of weaner pigs when used as a feed stuff in swine nutrition as a way of controlling its problematic environmental impacts

MATERIALS & METHODS

Twenty four (24) healthy Large White and Landrace weaners male and female pigs weighing 10-12kg, purchased from Obasanjo farms Nigerian Limited, Otta, Ogun State Nigeria were used in this study. The experiment was carried out at PATICO FARMS NIGERIA LIMITED, located at Bomadi Local

Government Area of Delta State and lasted for ten weeks (70 days) with two weeks as a stabilization period. The weaner pigs were allocated to four dietary treatments groups A, (free of water hyacinth) as the control, and treatments B, C and D in water hyacinth inclusion levels of 10%, 20% and 30% replacement of SBM respectively, in a Completely Randomized Design (CRD). Each treatment was replicated three times with two weaners per replicate. The ash-green fresh water hyacinth (*E. crassipes*) were harvested, washed both roots and leaves. And were sun dried and ground to powder form according to Wekhe and Njoku (2002) before incorporation into the basal diet at different levels of inclusion to replace Soya bean meal (SBM) Kilogram for kilogram. A balanced diet was formulated, with Soya bean substituted with different levels of

water hyacinth to form the treatments. The feeds were locally compounded with the following ingredient; maize, soya bean meal, palm kernel cakes, bone meal, salt, premix, DL – lysine and DL – methionine (Table 1). At the end of the experimental, blood samples were collected from randomly selected representatives of two of each treatment group through the ear veins and decanted into sterile container with EDTA fortified. The blood samples were properly labeled and sent to University of Port Harcourt Teaching Hospital (UPTH) for laboratory analysis of the haematological parameters according to Jain, (1986). One way classification was employed to test differences between means using the method of Duncan (1955).

TABLE 1: Percentage Ingredient and Chemical Composition of Experimental Diets

Parameters	Dietary Treatments			
	A(control)	B	C	D
Maize	46	46	46	46
Soya Bean Meal	30	20	10	0
Water Hyacinth	0	10	20	30
Palm Kernel Cake	20	20	20	20
Borne Meal	2.50	2.50	2.50	2.50
Salt	0.50	0.50	0.50	0.50
Vitamin / Mineral Mix	0.50	0.50	0.50	0.50
DL - Methionine	0.25	0.25	0.25	0.25
DL- Lysine	0.25	0.25	0.25	0.25
TOTAL	100	100	100	100

Vitamin / Mineral Premix (Animal Care Product), The following were present 1kg Vit A – 10,000,000 I.U, D -2,000,000I.U, B₁-0.75kg, Nicotinic acid – 25g, Calcium panthothenate 1.5g, B₁₂- 0.015g, K-2.5g, Biotine -0.4g, Folic acid - 8g, Iron-32g, Iodine -0.8g, Manganese -64g and Zinc – 40.

TABLE 2: The effect of Water Hyacinth on Haematological Characteristics of weaner pigs

Parameters	TREATMENTS			
	A (Control)	B	C	D
	0%	10%	20%	30%
Heamoglobin (g/dL)	12.78+0.02	12.69+0.13	13.04+0.56	12.7 +0.12
Red blood cell(106/ μ L)	7.00+1.23	6.20+0.82	7.10+0.70	6.90+0.32
Pack cell volume(%)	38.33+1.44	39.30+2.44	40.21+3.56	38.49+1.32
White blood cell(%)	16.62+0.69	15.88+3.22	17.33+0.88	16.84+0.42
Lymphocytes %	58.62+3.98	54.41+4.55	55.43+6.33	50.19+1.44
Monocytes %	4.32+0.67	3.95+0.32	4.85+0.11	3.67+0.28
Eosinophils%	3.11+0.06	3.00+0.12	3.98+0.22	4.21+0.22
Neutrophils%	33.86+0.66	38.61+3.44	30.33+6.75	31.08+4.22

RESULTS & DISCUSSION

Table 1 shows the hematological parameters of pigs fed graded levels of water hyacinth (*Eicchornia-crassipes*). All the parameters measured were not affected by the dietary treatments ($P > 0.05$). These results obtained in this study is similar to those of Olabonji *et al.*, 2007 and Ojebiyi *et al.*, 2007 who fed wildflower leaf-blood meal and cassava peel-blood meal based diets to rabbits. Thus revealing that, water hyacinth (*Eicchornia crassipes*) compared favourably with other non-conventional ingredients like wild flower leaf-blood meal and cassava peel-blood meal. The similarity in the value of haematological parameters could be related to nutritional

adequacy and safety of the test-ingredient. The values obtained showed that those animals were well nourished and that they were able to provide essential amino acid and minerals necessary for the normal functioning of the haemopoetic tissues (Ezeagu *et al.*, 2002). Since there was no differences in white blood cell counts and its differentials that is usually elevated when the the animal is under stress due to irritant or nutritional stress (Mitruka and Rawnsley 1997), there is no fear of imminent hazards that may be associated with the use of water hyacinth (*Eicchornia Crassipes*) as feed stuff. It can be concluded from the findings of this study that the real long term,-economically viable and environmentally friendly solution

to the water hyacinth menace is to utilize it as feed ingredients in swine diets. This will help in recycling water hyacinths into a useful feed resource, thereby help in reducing cost of feeding.

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