PHYSIOLOGICAL EVALUATION OF THE HEAMATOLOGICAL STATUS OF PIGS IN A GOVERNMENT OWNED FARM IN KOGI STATE NIGERIA

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ABSTRACT

Nutrition is a very important aspect of pig production and affects the blood values of pigs, but most farmers are ignorant about the nutrient requirements of pigs. On this note, a study was carried out to evaluate the changes in blood parameters of swine that was mostly fed crop residue and periodically with little concentrate as supplement. A total of 30 pigs comprising 10 piglet, 10 growers and 10 adult were used for this study. The pigs were adequately housed, while feed and potable water were supplied *ad libitum*. The crop residues fed were cassava peals, yam peals and amaranths vegetable supplemented with little concentrate for a period of 9 weeks. Ten (10) pigs were randomly sampled from each treatment and blood collected into an EDTA bottle. The samples were analyzed for full and differentia blood count. The finding of the study revealed that growing pigs fed the diets were significantly ($P<0.05$) nutritionally stressed as their haematological and differential counts were outside the normal range recommended for pigs. It thus becomes imperative to pay attention to the quality of feed fed to livestock and considerations also should be given on the influence of feed on blood parameters of farm animals

INTRODUCTION

The importance of nutrition in pig production cannot be overemphasized. The old saying "you are what you eat" relates not only to human being but also to farm animals including pig (Okunnade *et al.*, 2010). Most government properties and enterprises are facing neglect in funding, maintenance and proper management, government farms are not left out because it is believed that government property is no body's property. Changes is administration, poor implementation of policies, delay in passage of budget among others have been the major constraint to effective funding in government farms. As a result of this, farm management/managers and attendants are forced to use available cheap materials with poor nutritive value to feed livestock pending when the processes of fund release gets to the farm management for livestock feed. Meeting the nutrient requirement of livestock is a major concern to nutritionist (Aka *et al.*, 2009). Nutritional status of an individual is independent of dietary intake and effectiveness of metabolic processes and it can be determined by either or combinations of clinical, anthropometric, biochemical or dietary methods (Bamishaiye *et al.*, 2009). According to Oyawoye and Ogunkunle (2004) haematological components, which consist of red blood cells, white blood cells or leukocyte, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration among others are valuable in measuring toxicity, especially, with feed constituents that affect the blood as well as the physiological and health status of farm animals. Afolabi *et al.* (2010) posited that changes in haematological parameters are often used to determine stresses due to nutrition and other factors. Most government farm animals are fed with various feed products without recourse to the health and physiological implications on the animals. Haematology remains the commonest parameter for measuring these implications (Aro *et al.*, 2013; Etim *et al.*, 2014). This study was therefore aimed at evaluating the heamatological status of pigs in a government owned farm.

MATERIALS AND METHODS

Experimental Site: This research was carried out at a popular government pig farm in Kogi state Nigeria.

Experimental Animals and Management: A total of 30 pigs comprising 10 piglet, 10 growers and 10 adult were evaluated in this study. The pigs were adequately housed, while feed and potable

water were supplied *ad libitum*. The type of feed fed to the pigs most times was crop residues (cassava peals, yam peals and amaranths vegetable), local brewer's residue, pap (akamu) residue and other kitchen waste supplemented periodically with little concentrate. The pigs evaluated have been on this diet for over nine weeks. Other standard management practices such as regular washing and cleaning of the pen house, dewarming, trimming of teeth and nails of pigs were regularly carried out. Ten (10) pigs were randomly sampled from each age group that represented the various treatments and blood was collected through vein puncture on veins at backside of the ears and tail region into an EDTA bottle. The samples were analyzed for full and differential blood count.

Statistic Analysis: Data generated from the study was analyzed using the general linear model of SAS software (SAS, 2002). Significant differences in means were separated using the Duncan's multiple range test in the SAS package.

RESULT AND DISCUSSION

The result of hematological characteristics shows that haemoglobin (Hb) was observed to be above the recommended range while the WBC for growing pigs was very low. The young however had significantly ($P<0.05$) higher white blood cells (WBC), packed cell volume (PCV) and haemoglobin (Hb) compared to the growers and adult. The packed cell volume (PCV) was similar in all the treatment groups and the values were within the normal range for pigs. The values of PCV and WBC of the young and adult pigs was within the normal range reported by RAR (2009); Etim *et al.* (2013) for pigs. It is expected because the young were newly weaned hence are not yet nutritionally stressed as there is still a carryover effect of nutrient derived from breast milk from the sow. On the other way round, the values obtained by the adult pigs could be because the adult pigs tends to consume and utilize more of this residue due to the relatively larger size of their caecum that tend to harbor some microbes for proper nutrient digestion and absorption. Physiological and nutritional status of animals could cause differences in values observed in blood haematology. Nwanbe and Elechi (2009) reported that lower values of PCV and Hb imply high level of blood dilution and low efficiency of cellular oxygen transportation. According to Togun *et al.* (2007) when haematological values fall within the normal range reported for the animal, it is an indication that diets did not show any adverse effect on haematological parameters during the experimental period but when the values fall below the normal range, it is an indication of anaemia. As reported by Bawala *et al.* (2007), low values for haematological parameters could be due to the harmful effects of high dietary contents. Copland (1976) stated that the cause of the lower values in pigs is thought to be due to malnutrition. The unusual increase in Hb value recoded in this study could be due the analytical procedure used. The result of differential blood counts shows that the rabbit had higher neutrophils and very low monocytes. The lymphocytes value was average among the age groups. However, the neutrophils of the adult and growers was significantly ($P<0.05$) higher than those of the young. The young and grower in turn recorded a higher lymphocyte value than the adult. The values of neutrophils recorded in this study were a little higher than the normal range (RAR 2009), while the lymphocyte and monocyte were within the normal range. Lymphocytes are known to play key roles in immune defense system of both man and animals (Ameen *et al.*, 2007). According to Copland (1976) significantly higher leucocyte count of pig is thought to be due to chronic pneumonia and parasitism. When WBC (leucocytes), neutrophils and lymphocytes fall within the normal range, it indicates that the feeding pattern do not affect the immune system, most immunological abnormalities observed in malnutrition are usually corrected after rehabilitation (Ameen *et al.*, 2007). Increase in neutrophils: lymphocytes ratio is a good indicator of stress (Minka and Ayo, 2007) which could be nutritional stress (Aro, and Akinmoegun 2012).

Conclusion

Nutrition is a very important aspect of pig production and affects the blood values of pigs, but most farmers are ignorant about the nutrient requirements of pigs. The finding of this study revealed that growing pigs fed the diets were nutritionally stressed as their haematological and differential counts were outside the normal range recommended for pigs. It thus becomes imperative

to pay attention to the quality of feed fed to growing pigs and considerations also should be given on the influence of feed on blood parameters of farm animals.

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Table 1. Full blood and Differential count of various age groups of pigs evaluated

Parameters	T_1	T_2	T_3	SEM	Parameters	T_1	T_2	T_3	SEM
PCV	36.67^{a}	39.88^{ab}	40.56^{a}	0.37	Neutro	55.46^{c}	56.56^{b}	57.88^{a}	0.30
HB	90.18^{b}	92.75^{ab}	94.13^{a}	0.83	Lymph	40.13^{a}	40.00^{a}	36.56^{b}	0.40
WBC	6.69^{a}	2.13^{b}	6.30^{a}	0.88	Mono	4.44^{b}	3.44^{c}	5.00^{a}	0.18

PCV: Packed cell volume, HB: Haemoglobin, WBC: White blood cell T_1: Piglets, T_2: Growers, T_3: Adult