PERFORMANCE CHARACTERISTICS OF BROILER CHICKENS FED WASTE WATER FROM FISH POND

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Abstract

This experiment is designed to study the effect the fish pond waste water on the performance characteristics of broiler chicken. Broiler production is one way by which animal production to support the continuously increasing population, so that the consumption of animal protein is assured to avoid nutritional diseases that may likely occur because of poor protein consumptions among human being. The experiment was carried out in the teaching and research farm of the Kwara State Polytechnic in Ilorin. One hundred- and twenty-day old chicks (DOC) was used for this experiment, the experiment lasted six weeks, there is just a treatment and control. Result of dissolved feed substances in the fish pond waste water that act as extra source of nutrients to the birds and this makes them better than those that did not have the dissolve feed substances, the result is same for feed intake, weight gain and feed to weight gain.

Keywords: broiler chicken, fish pond waste, animal protein, food

Introduction

The population of the whole world keeps increasing without any control especially that of Africa and so the need to increase food production has come, so, as to support the increase in population (Lawal et. al., 2023). Broiler production is one way by which animal production to support the continuously increasing population, so that the consumption of animal protein is assured to avoid nutritional diseases that may likely occur because of poor protein consumptions among human being (Abu, 2018). Broilers, being fast-growing meat-type birds, their rate of growth of broiler birds is very high and that is why the government of every country try to develop the industry, to meet up with production of meet. Unfortunately, the aim may not be achieved in Africa especially in Nigeria because the exorbitant cost of chicken and products owing to high cost of feed which accounts for 60% - 90% total cost of production (Abu, 2018). Therefore, for the cost of feed to come down, so that every Nigerian can afford it, then the alternative feed should be sourced and that is why the use of waste water from fish pond was put into use for feeding broiler chickens because of the dissolved feed in the water.

Fish Pond Wastewater is a cloudy fluid arising from pond, containing mineral and organic matter in solution or having particles of solid matter floating, in suspension, or in colloidal and pseudo- colloidal form in a dispersed state. Water is very precious for every living organism on this earth (APHA), 1998. Fisheries resources are fishery products or output that arises from capture fishery and Aquaculture or Fish farming Amadou et al (2013). Capture fishery comprises resources caught from open Water bodies like Rivers, Lakes, Reservoirs or Dams and Oceans, while Aquaculture or Fish farming is the rearing of fish in an enclosed environment (like Tanks, Ponds, Reservoirs, Dams etc.) which allows free movement, feeding, breeding, and harvesting of fish in a well-planned manner. More than 120 million People throughout the World are estimated to depend on fish for all or part of their income (http;/wif.Jcs.net/icst 2006/jsp files/wif/home.jsp.2006), thereby ensuring food security, raising the protein level of the Nation's populace, improving their welfare apart from the economic situation of the country. Fisheries resources are also known to serve for recreation and international trade aiding foreign exchange and increasing revenue of a country (Godwin, and James, 1990). Fishery resources are known to play vital roles in national development, a lot of constraints militate against the fishery subsector.

Although, other means to support the protein requirement of the eve-increasing population aside fish production, is poultry production and products, which is expected to bridge the nutritional requirement to prevent nutritional disease that may likely break out because of lack of enough consumption of required amount of nutrients like animal protein Asante et al (2020). Broiler chicken attracts consumers because of its characteristics such as fast growth rate, early feathering higher qualifications of feed conversion, and eligible flesh color (Bessei, 2006). The importance of broiler chicken meat production stands out that poultry meat is the best alternative to red meat, there is always a high demand for it, characterized meat chicken breeding projects limiting capital cycle and speed time to recover. Today, broiler breeding projects have become widespread in many developed and developing countries. A large number of chickens can be grown in a small area and very high profits can be obtained in this very small area that cannot be used as agricultural land. The poultry industry is becoming increasingly important as most poultry farms in Nigeria are small and spread across most provinces of the country, providing jobs for tens of thousands of unemployed people in Nigeria (Natali, 2010). Poultry meat is an important source of high quality protein, minerals, and vitamins to balance the human diet (Sarica and Cam, 1998). In the case of meat consumption per capita of red and white meat are on an increasing trend (Aw-Hassan et al., 2010).

There is a relationship within all the livestock and between livestock and crop plants in Agriculture, ranging from feed, their products and even feaces. The relationship between crop plant and animals has being, using animal feaces to grow plant crop while the crop itself is used to feed the animals, all these depend on how the farmer can maneuver the situation on his farm Lawal et. al., (2023). The integrated poultry-fish farming offers opportunities to these resource-poor families at meagre financial investments and addresses the issues of women empowerment and livelihood security at the gross root level. To encourage poultry entrepreneurship among women SHG-members/rural households, a centrally sponsored scheme 'Poultry Venture Capital Fund' has been implemented in capital subsidy mode to support backyard. Agriculture and livestock are the key contributors to a country's economy and agricultural occupation. However, changing climate and erratic distribution of rainfall negatively affect the agriculture and livestock sectors. Since the 1980s, climate change has already reduced crop yields by about 5%−10% in notable areas (Iizumi and Ramankutty, 2016). The overall production of maize, rice, wheat, and soya is projected to fall to 9% by 2030 and 23% by 2050 worldwide (Haile et al., 2017).

Major coastal areas with their high levels of agriculture are currently prone to be mainly affected; this includes Bangladesh and Vietnam, and drought-prone locations such as large parts of East and West Africa, Morocco, and parts of South Asia and China. This not only damages agriculture but also has a huge economic impact since climate change leads to fluctuating food prices, which have an indirect negative effect on production as these fluctuations signal risk and reduce incentives to invest in agriculture Kochewad et al (2017). At present, employment in agriculture has been drastically reduced, and there is practically no scope for horizontal growth of land for food production; which is mostly owing to the ever-increasing human population and diminishing land resources. To ensure that farm households receive a sufficient amount of money on a regular basis, only vertical expansion is feasible by integrating appropriate farming components that demand less area and time Kuma et al 2017.

Further global warming is a major threat to humans for sustainable food production. Approximately 20% of the yearly contribution of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) gas emissions is from the agriculture sector. So, it is necessary to develop alternative strategies to mitigate GHG emissions as well as to improve the production and productivity of crops. Studies conducted in Indonesia on reducing greenhouse gas emissions by adopting IFS practices also show promising results (Munandar et al., 2015). Integrated farming system (IFS) with livestock is one of the traditional practices in rural India among farmers of small and medium categories. It is very important for farmers to diversify their crops with dairy, goatery, fishery, poultry, duckery, and so on to increase income (Kumaraet al 2017). The holdings should be evenly distributed compared to land holdings among the farmers (Kochewad et al., 2017). An IFS places an emphasis on recycling farm wastes and reducing the hurdles of their management in an effective and useful way. This can be achieved by making various components of the farming system work together for higher total productivity than individual productions. The wastes/and by-products from one enterprise are used as inputs for another to enhance productivity and lower the cost of production Kumar et

al 2012. With India's shifting agrarian situation, the IFS appears to be a viable option. Overall, an IFS achieves numerous goals, including helping farmers become self-sufficient by ensuring that family members have balanced food, raising living standards by increasing employment and total net income, reducing risk and uncertainty, and maintaining environmental harmony (Mali et al., 2014).

Furthermore, IFS is considered to be the most viable and efficient option in Southeast Asian regions, especially for enhancing the productivity of small and marginal farmers; similarly, IFS experiments conducted throughout various countries also showed a positive impact on farm productivity. In Indonesia, it has been found that the IFS integration of corn/horticulture-cow, supported by irrigation ponds, can increase income from IDR 4,094,000 in 2005 to IDR 9,696,300 in 2008, an increase of 136.84 percent (Adijaya et al., 2009). Further experiments with integrated farming systems in the Philippines and Thailand also registered higher yields with improved net returns. In Bangladesh, the integration of different components such as crops (0.65 ha), vegetable farms (0.12 ha), other crops fields (0.09 ha), and a homestead (0.08 ha) with 2.17 numbers of cattle and 11.69 numbers of poultry birds recorded higher profitability (Uddin and Takeya, 2006).

Justification

Fish pond water contains dissolved feed substances that could still be useful in raising farm animals in an attempt to reduce the cost of feeding farm animals.

The fish pond water are often discharged to the environment where the farm are located and this is dangerous to the livestock and even the farmer himself, it causes nuisance, but by feeding the waste to broiler chicken, this problem will be completely eradicated

Objectives of the project

i-Source for regular supply of fish pond waste water for the period of experiment
ii-Feed the fish water to broiler birds
iii-Study the effect of the waste water by taking data on performance characteristics.

Materials and methods

The experiment was carried out in the teaching and research farm of the Kwara State Polytechnic in Ilorin. One hundred- and twenty-day old chicks (DOC) was used for this experiment, the experiment lasted six weeks, there are just three (3) treatment and control T0, making four altogether, the waste water was added in such a way that we haveT1 which is 1l added to 4lts of drinking water, the second wasT2 and is 2lts added into 4lts of drinking water and the last was pure waste water no mixture with ordinary water and is tagged T3. The experimental feed was compounded in such a way that it is a straight feed with 23%, and that is what the birds will consume for both starter and finisher as shown in table 1 The control was replicated three times and each replicate has ten (10) chicks each meaning there are thirty birds for control while the remaining 120 chick was separated into their cage in such a way that there are ten chicks in each section and replicate thrice, these set of 120 DOC was fed waste water from day one till the end of the experiment while the other set was used as control, they were are not given waste water but ordinary water, the waste water from the pond must have been collected a before and are allowed to settle in the shade before being served to the birds the birds were managed in such a way that fresh feed and water was served every morning ad-libitum, the drugs and vaccines was followed duly and at appropriate time as shown in table 2. The feed intake, weight gain and feed to weight gain was monitored and the blood sample of both control birds and those that took treatment was taken for analysis at the end of the sixth week of the experiment. Data collected was analyzed using SAS 2012 version.

Table 1: showing the composition of the experimental feed

Ingredients	**Kg**
Ingredients	
Maize	450
Soy bean	239
Groundnut cake	117
Wheat offal	111
Palm oil	17.5
Fish meal	30
Bone meal	20
Limestone	10
DL-Methionine	2.5
Lysine	1
Vitamin/mineral premix[a]	2.5
Salt	2.5
Enzyme	0.5
Nutrients[b]	
Metabolizable energy (MJ/kg)	11.03
Crude protein	230.3
Crude fibre	40.1
Lysine	11.2
Calcium	12.8
Phosphorus	7.9
Methonione	3.0

[a]Providing per Kg diet: 12,500IU vitamin A,; 2,500IU vitamin D3; E,18.75mg vitamin; 2.65mg vitamin K3; 2mg vitamin B1; 6mg riboflavin,; 0.025mg vitamineB12; 0.0325mg Biotin; 1.25mg Folic acid; 12mg Panthothenic acid; 50mg Niacin; 8mg Copper; 75mg Zinc; 80mg Iron; 100mg Manganese; 0.15mg Selenium; 0.35mg Iodine; 60mg Salinomycine; 0.1g Chlortetracycline; 2.0g Choline chloride; 0.3g Ethoxyquin.
[b]Determined values except for metabolizable energy,lysine,methionine, calcium and phosphorus were calculated from the published composition of the ingredients used

Table 2 shows the Vaccination and medication Programme.

WEEK	DAYS	MEDICATION
1st	Day 1	Antistress, Glucose, Multivitamin
	2nd – 6th	Multivitamins
	7th	Gomboro vaccine
2nd	8th – 13th	Vitamins
	14th	Lazota
3rd	15 – 20th	Anticocci then vitamins next day
	21st	Vitamins
2nd Gamboro		
	22nd – 27	Vitamins
4th	28th	2nd lazota

	$29^{th} – 34^{th}$	vitamins
5^{th}	35^{th}	Fowlpox vaccines
	36 – 41	Vitamin
6^{th}	42	Decorim

Results and Discussion

The performance characteristics of broiler chicken fed fish pond waste water is shown below in table 3. It was noticed that there was a significant difference occurred in feed intake between the birds fed different levels of waste water and those fed pure waste water T3 was significantly difference when compared with others (P>0.05) including the control, this may be as a result of dissolved vitamins and minerals in the waste water that aid (appetite) their feed, this could further be expatiated and noticed because as the waste water increases then the feed consumed increases. The same trend follows in weight gain and this is simply because the more the feed consumed the more it is translated to body weight though statistically significant differences did not occur, however the T3 and T1 had the same value while the control is the least.

Table 3: Performance characteristics of broiler bird fed fish-pond waste water

Parameters	**Control**	**T1**	**T2**	**T3**	**SEM**
Feeding take	815b	935^{c}	922^{b}	940^{a}	1.01
Weight gain	472^{b}	609^{a}	606^{a}	609^{a}	1.22
Feed to weight gain	1.72^{a}	1.53^{c}	1.52^{c}	1.54^{b}	0.6

Conclusions and Recommendations

Conclusions

i-Waste water from fish pond could still be put into use, it should not be trown away again
ii-It contains some dissolved feed substances, so it could be used to feed some livestock or used in growing vegetables.
iii-It support the growth of broiler birds

Recommendations

i-The fish pond waste water should also be tested in other livestocks

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