



**Growth response of broiler chickens fed false yam (*Ipomoea pes-caprae*)
tuber soaked in saltpetre solution**

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ABSTRACT

An experiment was conducted to determine the effect of false yam tuber soaked in 0.1% saltpetre solution on growth performance of broilers. Tubers were peeled, chopped into pieces (~2 cm), soaked in 0.1% saltpetre solution for 12 d with the solution being changed every 3 d, sun-dried and ground. At 23 d of age, 120 chicks (Cobb strain) were divided into 12 groups of 10 birds each. Four treatments comprising treated tuber meal at 0 (Control), 80, 100 and 120 g/kg were tested using a completely randomized design with each treatment being replicated three times. Birds were fed for 33 d. Feed and water were provided ad libitum. Data were analysed by ANOVA using GENSTAT. Feed intake was similar ($P>0.05$) for all treatments. There was slight depression ($P>0.05$) in feed efficiency for all birds fed the treated tuber meal. However, all treatments had similar ($P>0.05$) weight gains and carcass yields. In conclusion, soaking of false yam tuber in saltpetre solution improved its utilisation by broilers. The product can therefore be fed up to 120 g/kg without adverse effect on performance.

Keywords: false yam tuber, soaking, saltpetre, performance, broiler chickens

INTRODUCTION

False yam (*Ipomoea pes-caprae*) is a perennial shrub that produces a large tuber with high starch content. It is commonly found in the Northern Region of Ghana, where it is of no food value. Nevertheless it has potential as a non-conventional feed ingredient for poultry if processed to reduce the toxic substances (e.g. gum resins) in the tuber (Dei et al., 2011).

Food processing methods can help control potential adverse effects of compounds in plants that are toxic to humans or animals when such foods are consumed. Thus processing of false yam tubers by soaking (Dei

et al., 2013) in water before drying improves its nutritional value for broiler chickens when fed up to 90 g/kg in the grower diet. Saltpetre (potassium nitrate) is known to have many uses because it can react with many different compounds. As an oxidizer, it reacts with terpenes. Carbon-carbon double bonds in the structure of some terpenes make the molecules reactive towards oxidizing agents (Pommer, 2003). It is not known how soaking false yam tuber in saltpetre solution would influence its nutritional value for poultry.

Therefore, this study was carried out to

determine the growth response of broiler chickens fed 80, 100 and 120 g/kg of false yam tuber meal processed using saltpetre.

MATERIALS AND METHODS

The false yam tubers were peeled with knife, chopped into pieces (~2 cm), soaked in 0.1% saltpetre solution for 12 d with the solution being changed every 3 d. The soaked product was then sun-dried and ground into a gritty meal (i.e. tiny particle size). The processed tuber sample was not analysed at the time of the study due to logistics constraints.

The study was conducted between December and February at Nyankpala in the Northern Region of Ghana, which is located in the Guinea Savanna Zone. The Zone is characterized by a wide diurnal temperature variation (28-45°C) with low day-time humidity (17-42%) during the dry season from November to April (Kasei, 1988).

A total of 120 Cobb strain chicks (520 g) at 4 weeks of age were divided into 12 groups and randomly assigned to 4 treatments resulting in 3 replicate pens per treatment. There were ten birds (6 males, 4 females) in each group. Four treatments comprising a Control (no tuber meal) and diets containing saltpetre treated false yam tuber meal as substitute for maize at 80, 100 and 120 g/kg in maize-fishmeal based diets were tested. They were housed in deep litter pens with a floor space of 0.13 m² per bird per pen. The Control diet contained 200 g/kg CP and 12.4 MJ/kg ME. The experimental diets were fed in mash form from 23 to 56 d of age. Feed and water were provided *ad libitum*. Light was provided 24 h daily. Both the feed and birds were weighed weekly to determine feed intake and live weight gain, respectively. Feed conversion ratio was defined as live weight gain per unit feed consumed. Mortality was also recorded. At 8 weeks of age, 2 birds (male, female) per replicate were randomly selected, starved for 8 h, weighed, slaughtered, dressed and carcasses weighed. Carcass yield was calculated as a percentage of the carcass dress weight over live weight. Data were analysed by ANOVA using GENSTAT (version 8; Lawes Agricultural Trust, 2005).

RESULTS AND DISCUSSION

There were no significant ($P>0.05$) differences in feed intake between the treatments (Table 1). There was slight depression ($P>0.05$) in gain/feed ratios of all the birds fed the treated tuber meal. However, there were no significant ($P>0.05$) differences in live weight gains and carcass yields among treatments (Table 1). Mortality was generally low.

The similarity in feed consumption of all the birds suggests debittering of the gum resins by the saltpetre. This could be due to modification of the structure of the toxic compounds in the tuber by oxidation. According to Pommer (2003), some terpenes are reactive towards oxidizing agents. Processing of the tuber using saltpetre solution appears to improve its feed value, since growth performance of the broilers tended to be the same when it was included in the diets between 80 and 120 g/kg (Table 1). In a preliminary study, feeding broilers with diets containing false yam tuber soaked in water at 120 g/kg diet had adverse effects on their growth performance (Alagma, 2012).

The nominal reduction ($P>0.05$) in growth performance of birds fed the treated tuber meal relative to the Control group may suggest residual effect of the anti-nutritional factors. Generally, growth performance of the experimental population was lower than expected, probably due to the high ambient day-time temperatures (29-38°C) prevalent during the study period. The Guinea Savanna zone is known to be characterized by high environmental temperatures (Kasei, 1988), particularly in the dry season (November-April) that can depress growth of broiler chickens (Donkoh, 1989).

CONCLUSION

Soaking false yam tuber in saltpetre solution improved its utilisation by broilers and could be fed up to 120 g/kg without adverse effect on growth performance.

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Table 1: Effects of false yam tuber treated with saltpetre on growth performance, carcass characteristics and mortality of broiler chickens (23-56 d of age)

Variable	Diets containing dry treated tuber meal (g /kg)				SED	P
	Control (0)	80	100	120		
Feed intake (g/bird/day)	119.4	120.9	117.6	115.5	3.37	0.461
Weight gain (g/bird/day)	40.58	37.40	37.15	37.15	1.306	0.078
Gain : Feed Ratio	0.34	0.31	0.32	0.31	0.016	0.307
Final live-weight (kg/bird)	1.863	1.753	1.747	1.747	0.0428	0.075
Carcass dress weight (kg/bird)	1.66	1.47	1.49	1.48	0.091	0.186
Carcass yield (%)	80.5	78.0	79.4	78.2	1.01	0.116
Mortality (dead/total)	1/30	1/30	0/30	2/30	-	-

SED-standard error difference, P-probability, Means with different superscripts are significantly different (P<0.05).