The effect of feeding malted sorghum sprout on laying characteristics of domestic hens

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Abstract
The objective of this study was to investigate the effect of feeding malted sorghum sprout (MSP) to laying birds. Diets were formulated to include 0, 150 and 300g kg^{-1} MSP in laying hens diet containing maize, soyabean meal, groundnut cake and palm kernel meal as main ingredients. A total of one hundred and forty four (144) twenty five (25) weeks old laying hens were used for the trial. Forty eight birds were assigned to each of the diets which were further sub-divided into four replicate groups consisting of twelve birds each. The result showed that egg production reduced ($P<0.05$) as MSP levels increased. Egg quality variables were not affected significantly ($P>0.05$) by MSP inclusion in the diet. It was concluded that the inclusion of MSP in the diet of layers even at 150g kg^{-1} did not yield satisfactory results. There is need to develop simple processing techniques to improve the utilization of MSP by laying hens.

Introduction

Alternative crops in Nigeria especially those that can be used for industrial purposes have gained prominence in recent times. Sorghum is an interesting option among these crops. This is because its use in the brewering and confectionery industries is becoming more popular by the day. To this end, an enormous quantity of by-products from malted sorghum is being turned out yearly. Malt is extracted from germinated sorghum seeds and the residue consists of sorghum shoots and roots. These residues are collectively referred to as malted sorghum sprout (MSP). Malting essentially involves soaking of cereal grain in this case sorghum for 24-48 hours under controlled condition of moisture, aeration and temperature. Thereafter the grains are transferred to an aseptically cleaned malting floor. The grains are allowed to germinate for 3-5 days. The resulting green malt is subsequently dried in a rotary dryer at a temperature of 70^0C. The dried friable malt is then mechanically agitated to free the roots and the shoots which are separated through screening.

Considering that poultry diets are usually maize based, it is frequently necessary to include other novel feed resources to attend to animal energy requirement, which increases feeding cost. Aning *et al.,* (1998) reported that sorghum rootlets otherwise called MSP may be fed up to 40% to rats. Most studies performed to evaluate the use of MSP in poultry have concentrated on its use in broiler and starting chicks. Thus, little information exists concerning the use of MSP in diets for layers. This study therefore was carried out with the aim of assessing the effect of feeding MSP on laying characteristics of domestic hens.

Materials and Methods

One hundred and forty-four (144) twenty-five weeks old laying hens were used. They were divided into three groups of forty eight birds. Each group was further sub-divided into four groups of twelve birds. They were housed in galvanized wire cages measuring 25 x 40 x 45 cm equipped with an automatic drinker. Feed and water were supplied *ad libitum.*

Sorghum grains were soaked under controlled conditions for 24-48 hours, thereafter allowed to germinate for 3-5 days. The green seedlings were subsequently dried and malt was extracted leaving dried roots and shoots referred to as malted sorghum sprouts (MSP). The MSP was sourced locally from reputable feed milling industries that got them from relevant

breweries and allied industries. Experimental rations were iso-caloric and iso-proteinous. The diets were formulated such that they contained 0, 150 or 300 g kg^{-1} MSP in maize, soyabean meal and groundnut cake based diet. Laying hens were distributed in a completely randomsied design. Feed intake, egg production, kilogramme feed per kilogramme egg and egg quality parameters were determined. Data collected were subjected to Analysis of Variance using SAS statistical software. Statement of statistical significance were made at ($P<0.05$) level.

Results and Discussion

Results showed significantly ($P<0.05$) lower egg production when 150 and 300 gkg^{-1} MSP were included in the diet. The progressive reduction recorded for MSP diets may be due to the presence of certain antinutritional factors (ANFs) in the feed. MSP is known to contain dhurrin a glucoside which on hydrolysis yield equal quantities of HCN. Tannin an ANF is also known to be present in MSP (Aning *et al.,* 1998, Oduguwa *et al.,* 2001, Oduguwa, *et al.,* 2005). Tannins are complex polyphenolic compounds with great structural diversity. They have been reported to have detrimental effect on performance (Aganga and Adogla-Bessa, 1999). These factors may have had a negative effect on nutrient utilization of the resulting MSP diets hence reduced laying performance. Kilogramme feed per kilogramme egg increased significantly ($P<0.05$) as MSP level increased. A lower value obtained for birds on 0g kg^{-1} MSP showed that the feed consumed were better utilized. Although the feed intake values of birds fed 0 and 150g kg^{-1} MSP diets were not significantly ($P>0.05$) different from each other, dietary treatment with 300g kg^{-1} MSP inclusion led to significantly lower ($P<0.05$) intake. This observation could be traced to the taste of the test ingredient. Aning *et al.,* (1998) and Oduguwa *et al.,* 2001 reported that MSP had bitter taste whereas Anganga and Adogla-Bessa (1999) opined that the presence of Tannin in any feed ingredient would depress palatability. No effect ($P>0.05$) of inclusion levels of MSP was observed on egg shape index, yolk colour and haugh unit values.

The findings of this study suggest that satisfactory result were not obtained when MSP was included in layers diet even at 150g kg^{-1}. More research needs to be carried out in order to alleviate the effects of the observed depressed performance.

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Table: Egg quality and performance of laying hens fed diets with different levels of MSP

Variables	Levels of MSP ($g\ kg^{-1}$) 0	150	300	SEM
Egg Produced Per Hen day	0.83^{a}	0.61^{b}	0.42^{c}	0.11
Kilogramme Feed Per Kilogramme Egg	2.07^{a}	2.06^{b}	1.90^{c}	0.01
Daily feed Intake	121.4^{a}	121.3^{a}	115.6^{b}	0.52
Egg Shape Index	0.71	0.72	0.73	0.06
Yolk Colour	1.4	1.9	2.2	0.08
Haugh Unit	53.0	52.9	53.9	0.06

^{abc} means on the same row having different super script were significantly different ($P<0.05$).

References

AGANGA, A. A. and ADOGBA-BESSA, T. 1999. Dry matter degradation, tannin and crude protein contents of some indigenous browse plants of Botswana. Arch. Zootec. **48**: 79 – 83.

ANING, K. G., OLOGUN, A. G., ONIFADE, A., ALOKAN, J .A., AND ADEKOLA, A .I. 1998. Effect of replacing dried brewer's grain with sorghum rootlets on growth, nutrient utilization and some blood constituents in rats. J. Food Sci. **74**: 185-190.

ODUGUWA, O. O., FANIMO, A.O., ODUGUWA, B. O., IYAYI, E. A. and OPADOTUN, A. I. 2001. Effect of enzyme supplementation on the nutritive value of MSP in rat. Trop. J. Anim. Sci. **4**(1): 189 – 195.

ODUGUWA, O. O., PIRGOZLIEV, V. R. and ACAMOVIC, T. 2005. Effect of polyethylene glycol, chacoal, phytase and xylanase on dry matter digestibility and metabolizable energy of Malted Sorghum Sprouts for broiler chickens. British Poultry Abstracts Vol. **1** Number 1 April 2005. 36 – 37.