

CHEMICAL COMPOSITION OF SUN-DRIED POULTRY DROPPINGS

ABDULWAHEED ADEYEMI BELLO

Abstract: Proximate analysis of sun-dried poultry droppings was carried out to determine its nutritive value. The droppings was subjected to sun treatment by sun-drying for approximately 6 hours daily for up to 5 days at the temperature range of 32-35°C (90-94°F). This was to safeguard against pathogenic micro organisms for its onward usage as animal feed and or feed supplement. Results obtained upon chemical analysis indicates that sun-dried poultry droppings from caged layers contained 2.65(kcal/g) gross energy; 93 % Dry matter; 21.88 % Crude protein; 20.67 % Crude fibre; 33.00 % Ash; 3.30 % Ether extract; and 14.15 % Nitrogen free extract. The result on Mineral constituents showed that the droppings have 0.54 % Phosphorus; 0.71 % Sodium; 0.92 % Potassium; 0.07 % Calcium; 0.06 % Magnesium. The result of the pathogenic microorganisms' concentration in the sun-dried poultry droppings showed that the total bacterial count (CFU/g) therein was 4.5×10^5 CFU/g. *Salmonella* and *E.Coli* was not detected in the product. From the values obtained in the proximate analysis and microbial count in this study, it shows that the droppings can be fed and or included into animal feeds.

Keywords: Mineral constituent; Poultry droppings; proximate composition; Sun-drying

Introduction: The concept of nutrient recycling has led to the use of many agricultural waste materials by other phase of agriculture [7]. The current global trend towards both animal waste and crop residue recycling is motivated by both economic (waste to wealth) and environmental (reducing environmental pollution) considerations. An excellent example of nutrient recycling is the feeding or incorporation of processed poultry droppings into animal feeds in which nutrients in the waste is converted into edible animal products for man's consumption. Additionally, it's an avenue for reducing the overall cost of livestock feed in livestock production enterprise. In view of the above therefore, this study was undertaken to determine the proximate composition and nutritive values of sun-dried poultry droppings for its usage as animal feed and or feed ingredient.

Materials and Methods: Poultry droppings were sourced from commercially reared layers from Abu-Turab commercial poultry farm in Minna, Nigeria. The droppings were subjected to sun treatment by sun-drying for approximately 6 hours daily for up to 5 days at the temperature range of 32-35° C (90-94° F). This was to safeguard against pathogenic micro organisms for its use as animal feed and or feed ingredient. Thereafter the product was grinded with the use of mortar and pestle. Proximate analysis was conducted according to [4] methods at the Faculty of Agriculture's laboratory for the determination of chemical and mineral composition of the sun-dried poultry droppings. Pathogenic micro organism concentration was determined using [10] procedures at the Department of Microbiology of the Institution.

Parameters	Compositions
Dry Matter (DM)	93.00
Crude Protein (CP)	21.88
Crude Fibre (CF)	20.67
Ash	33.00
Ether Extract (EE)	3.30
Nitrogen Free Extract (NFE)	14.15
Gross Energy (Kcal/g)	2.65
Phosphorus (P)	0.54
Sodium (Na)	0.71
Potassium (k)	0.92
Calcium (Ca)	0.07
Magnesium (Ma)	0.06

Result: Table 1 shows the chemical and mineral constituents of the sun-dried poultry droppings. The values obtained upon proximate analysis indicates

that the droppings contained 93.00 % Dry matter; 21.88 % Crude protein; 20.67 % Crude fibre; 33.00 % Ash; 3.30 % Ether extract; 14.15 % Nitrogen free

extract and 2.65 kcal/g gross energy. The results on mineral constituents showed that the droppings have 0.54 % Phosphorus; 0.71 % Sodium; 0.92 % Potassium; 0.07 % Calcium; and 0.06 % Magnesium. The result of the pathogenic microorganisms' concentration in the sun-dried poultry droppings showed that the total bacterial count (CFU/g) therein was 4.5×10^5 CFU/g. *Salmonella* and *E.Coli* was not detected in the product.

Discussion: The value obtained for Crude protein in this study (21.88 %) was less than 26.60 % documented by [9] and 28.20 % reported by [1], but greater than 15.40 %; 20.30 %; 20.00 % reported by [8], [12] and [13] respectively. The differences in values reported by the various authors may be attributed to a number factor such as the condition under which it is processed; the ratio of litter to manure; bedding material type; the feed fed to the birds; handling and storage methods as well as the age and condition of the birds. Because of the presence of wasted feeds; feathers; eggshells and bedding materials, Ash content are usually high. In the present study, the Ash content of the dropping is 33.00 %. This value is higher than the values reported by [6], 15.60 %; [13] 18.50 %; [8] 20.50 %; but lower than 41.60 % reported by [15]. The dry matter content of the droppings in this study was observed to be 93.00 % which is lower than the values reported by [8] 94.30 % and [12] 97.50 % but higher than the value reported by [17] 90.00 %. The value agrees with the

value reported by [9]. The energy content of the dropping (2.65 kcal/g) was lower than the value reported by [5] 3.85kcal/g and [16] 1.82Mj/kg but higher than the values reported by [17] 2.47 Mcal/kg; [9], 1.01Mj/kg respectively. The lower values reported generally by most of authors may probably be due to high content of Ash in the droppings and this is attributable to the bedding materials used such as sawdust [15]. The phosphorus value obtained (0.54 %) was higher than 0.23 % and 0.27 % reported by [11] and [3]. However, calcium content reported in this study was lower than those reported by [11] and [3] respectively. The total bacterial count of the sun-dried poultry droppings in this study 4.5×10^5 CFU/g was drastically lower than the count reported by [17]. This was possibly due to the action of ultra violet rays of the sun affecting the micro organisms. Additionally, the decrease in viable bacterial cell noted in the droppings may also be due to a reduction in the moisture content [2]

Conclusion: This study showed that sun-dried poultry droppings have good nutritive value. The study also indicated that sun-drying as a method of processing the product considerably lowers the pathogenic microorganism concentration. Based on the findings of this present investigation sun-dried poultry droppings may be suitably fed and or incorporated into the animal feed without compromising its nutritive value as well as posing any health risk.

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A. A. BELLO / Postgraduate student / Department of Animal Husbandry and Dairy Science/ College of Agriculture/ Dr. B.S.K.K.V. Agricultural University Dapoli,/ Pin: 415 712 Dist: Ratnagiri (Maharashtra) India/ aabello2003@yahoo.co.uk