Effect of Beet Molasses as A Source of Energy on Performance of Broiler Chickens

M Abdelgader¹, H I H Haren¹, Ismoyowati² and N Iriyanti²

¹Department of poultry, Faculty of Agriculture, Omdurman Islamic University, Khartoum, Sudan
²Faculty Of Animal Science, Jenderal Soedirman University, Purwokerto, Indonesia

Email: modawy86@yahoo.com

Abstract. Molasses can be a source of quick energy and an excellent source of minerals for farm animals and even chickens. Molasses can also be a key ingredient for cost effective management of feeds. The purpose of this research was to study the impact of adding different levels of sugar beet molasses to feed on performance of broilers chickens. Used 112 of commercial broiler (Ross 308) 1-day-old chicks were weighed in gram live weight ranged between 50-57g and subsequently placed in the treatment groups in such a way that the mean weights differed as little as possible, chicks divided into four groups replicates of 7 chicks each and reared on deep litter in open housing system. Four replicates were designed to each dietary treatment. at 15-days-old chicks, the unsexed broiler chickens were randomly allotted to four groups of 7 birds each. The four diets consisted of Group (A) as a control diet containing no Molasses, Group (B) was 5 %, Group (C) 7.5 % and Group (D)10%. Feed and water were provided ad libitum. There were no significant differences at all level (P > 0.05) of adding beet molasses as source of energy among four experimental groups for the parameter studied: body weight, body weight gain, feed intake and feed conversion, also there is no mortality however, Use of beet molasses in broiler diets reduced feed cost and feeding of 7.5 % beet molasses decreased cost of feed per kg versus control and increase profitability.

Keywords: beet molasses, broiler chickens, performance

1. Introduction
Sudan is the second largest country in Africa, covering over 1,882,000 km², lies within the tropical zone between latitudes 8.45 to 23.8 North and longitudes 38.24 to 21.4 East [1]. Mean annual temperatures vary between 26 °C and 32 °C across the country and the Sudanese sugar industry is famous for high value sugar cane molasses the average annual production of cane molasses in Sudan except Kennan sugar factory is about 600 tons per year according to...
Sudanese sugar company (2009) 75% of this amount is exported; some of the 25% has been used locally for production of alcohol and animal feed. Poultry particularly geese and ducks, can be fattened on liquid diets containing up to 60% DM of molasses, preferably high-test, A or B molasses. Theoretically, the same system, level and types of molasses work for broilers and layers, however the management factor is crucial. An on-farm, immediate-use, mixing system to include 18 to 24% DM of high-test, A or B molasses in dry feeds for poultry is possible.

Molasses can be a source of quick energy and an excellent source of minerals for farm animals and even humans. Molasses can also be a key ingredient for cost effective management of feeds and pastures. The calcium content of sugar cane molasses is high (up to one percent), whereas the phosphorus content is low [2]. In poultry, molasses is commonly used as a binder in dry poultry diets and as an energy source. Similarly, its administration to chickens through drinking water has been reported [3]. In Egypt, chicks raised on sand or wheat straw and supplemented with 4% molasses gave better performance than chicks reared on wheat straw only [4].

The rising prices of raw materials essential in the manufacture of feed and reduction in poultry feed such as corn, soybean and other raw material, which is a source of energy and protein in the diets of poultry had to be to provide economic alternatives which are available in large as well breeder poultry, well give poultry you need of protein and energy taking into account that the bush suitable for the quality of the output whether the growth of fattening whites as well as taking into account the provision of the bush good for the bird in terms of quantity and quality, as well to be a bush healthy containing not only the protein and energy needed but also contain carbohydrates, fiber and fat appropriate for every age and every type as well as vitamins and minerals are essential for the bird to give weight and good production depending on the strain of each and every age and every type breeders and all this requires the provision of a balanced diet and economic poultry farmers significantly and at the same time increase the revenue and profit of raising poultry [5].

The purpose of this research was to study the impact of adding different levels of sugar beet molasses to feed on performance of broilers chickens.

2. Methodology
This study was carried at Omdurman Islamic University 112 of commercial broiler (Ross 308) 1-day-old chicks Before the start of the feeding trial the birds were weighed in gram live weight ranged between 50-57g and subsequently placed in the treatment groups in such a way that the mean weights differed as little as possible also chicks vaccinated against Newcastel and Gumbroro diseases at 5, 15 and 28 days chicks divided into sixteen groups of 7 chicks each and reared on deep litter in open housing system constructed of brick wall 50 cm height and the rest of the wall is made from the zinc sheets. Four replicates were designed to each dietary treatment. at 15-days-old chicks, the unsexed broiler chickens were randomly allotted to four groups of 7 birds each. The four diets consisted of Group (A) as a control diet containing no Molasses, Group (B) was 5 % [6], Group (C) 7.5 % and Group (D)10%. Feed and water were provided ad libitum. The ingredients of the experimental diets, as shown in Table 1. All diets were formulated to contain equal amounts of true protein, energy and other nutrients according to National Research Council (NRC) requirements for broiler chickens [7].
Table 1. Ingredients composition of the experimental diets (%). Ingredients composition calculated and actual chemical analysis of the experiment diets (%)

| Ingredients (%) | Finisher (A)0% | (B)5% | (C)7.5% | (D)10% |
|-----------------|----------------|-------|---------|--------|
| Sorghum         | 60.63          | 62.76 | 58.79   | 57.19  |
| wheat bran      | 12.26          | 3.16  | 3.06    | 2.18   |
| Ground nut cake | 12.77          | 14.89 | 15.45   | 13.83  |
| sesame cake     | 6.38           | 5.86  | 7.45    | 9.04   |
| Broiler concentrates* | 5.00 | 5.00 | 5.00    | 5.00   |
| L.stone         | 1.06           | 1.38  | 0.80    | 0.79   |
| Salt            | 0.41           | 0.25  | 0.25    | 0.27   |
| Lysine          | 0.53           | 1.14  | 1.14    | 1.14   |
| methionin       | 0.96           | 0.56  | 0.56    | 0.56   |
| Molasses        | 0.00           | 5.00  | 7.50    | 10.00  |
| Total of price ($) per ton | 411.1 | 398.3 | 392     | 385.6  |

Determined chemical analysis of the experiment diets

| Parameters          | Finisher (A)0% | (B)5% | (C)7.5% | (D)10% |
|---------------------|----------------|-------|---------|--------|
| ME(Kcal/kg)         | 3166           | 3150  | 3155    | 3146.2 |
| Crude protein(%)    | 20.1           | 20.9  | 20.7    | 20     |
| Crude fat(%)        | 3.2            | 3.0   | 2.8     | 2.9    |
| Crude fiber(%)      | 5.0            | 4.9   | 4.8     | 5.0    |
| Calcium(%)          | 1.25           | 1.26  | 1.27    | 1.26   |
| Av.Phosphorus(%)    | 49             | 48    | 47      | 47     |
| Methionine(%)       | 0.49           | 0.48  | 0.48    | 0.49   |
| Lysine (%)          | 1.25           | 1.25  | 1.25    | 1.25   |

Source: [8]

Body weight (BW) of chicks were determined by weighing birds group each week and feed intake (FI) was determined every week for each group. Body Weight gain (BWG) was calculated weekly by subtracting the body weight of previous week from present body weight. Feed conversion ratio (FCR), (g feed/g gain) was calculated by dividing the amount of feed consumed by body weight gain.

A completely randomized design (CRD) was used and data were subjected to analysis of variance using the SPSS statistical package (version 16.0) followed by Duncan's method to compare treatment means. Values of P<0.05 were considered significant.

Table 2. Performance of Broiler Chicks fed Different Levels of Molasses during 4 weeks

| Parameters          | A (0)          | B (5)          | C (7.5)         | D (10)         | SE     | L.S  |
|---------------------|----------------|----------------|-----------------|----------------|--------|------|
| Feed intake         | 3504.48±81.99  | 3617.23±133.08 | 3522.73±89.05   | 3509.65±192.63 | 31.78  | NS   |
| Final body weight   | 2198.25±116.84 | 2430.75±119.23 | 2516.25±60.15   | 2323.50±106.25 | 38.47  | NS   |
| BWG                 | 1333.48±72.07  | 1502.38±107.24 | 1546.65±59.98   | 1381.60±70.47  | 28.57  | NS   |
| FCR                 | 2.63±0.12      | 2.41±0.15      | 2.29±0.10       | 2.54±0.02      | 0.04   | NS   |
| Mortality (chicks)  | 0              | 0              | 0               | 0              | 0      | NS   |

SE: Stander error, Mean±SD: Standard deviation, L.S: Level of significant NS: No significant.
3. Result and Discussion

The effect of dietary treatments on feed intake, final body weight, body weight gain, feed conversion ratio and mortality rate are shown in Table 2. Total feed intake was not significantly (P>0.05) highest for the group fed 5% molasses compared to the other groups fed (0, 7.5 and 10%) molasses.

Final body weights were similar and not significantly different (P>0.05) affected body weight of broiler for all studied period as shown in Table 2 in groups fed diets on (7.5%) molasses were better when compared to the group (0%, 5%, 10%). Body weight gain of broiler was no significantly (p>0.05) by application of molasses they find an increase in body weight gain Table 2. In the present study molasses groups 5%, 7.5% which were higher when compared with the other group (0%, 10%). Feed conversion ratio among tested groups were not significantly (P>0.05) affected by molasses level Table 2. Molasses treatments had no recorded mortality among experimental groups.

Feed intake treatment B with molasses 5%, 3617.23 tendencies the best and more molasses content, consumption more decrease but more but more higher compare the control. Increasing feed intake caused by palatability feed content molasses, taste of molasses was sweet but if the content of molasses more higher will increase potassium content be consumed more higher consumed potassium caused sticky, dropping, diarrhea and body weight decreased that is higher potassium cased physiology could be decreasing feed intake. The best final body weight at level 7.5% molasses treatment (C) and level 5% molasses treatment (B) because the best consumption feed intake 2430.75g treatment B (5%molasses) and 2516.25g treatment (7.5% molasses).

The increasing body weight caused by nutrition available more higher compare the usage molasses more higher, if molasses most higher could cause diarrhea and sticky dropping, cake letter result disturb the health of broiler by increasing ammonia (NH3) level in broiler housing caused respiration disturb. If ration to be composition isocaloric and isonitrogenous the feuoneuca chicks will stop to eat energy need sufficient, it's not assure, if physiological condition was disturb. That is caused at the level molasses higher caused broiler diarrhea stick dropping and cake litter. The increasing feed intake, nutrition need will be enough. Body weight component consists of protein, energy carbohydrate, vitamins mineral. If the nutrition need be enough covered the weight gain increasing. Conclusion that usage molasses 5% - 7.5% was better to increase final body weight and body weight gain.

Mortality if there were not mortality on the broiler be given high molasses level may be could make abnormal physiology was not caused until mortality on broiler.

4. Conclusion

The study showed that, molasses treatments had no effect on broiler chick’s performance. In this study the dietary observed to have no adverse on broiler chicks. Where were assessed addition molasses as an alternative energy source compared to other materials until to 7.5% is suitable for not effect of problems in digestion and performance but addition a high molasses not decrease body weight gain but the fasces it was wet dropping, will disturb its health. Without doubt the high cost of kg feed for control group is attributed to the higher price of sorghum grains, which constitute 60% of the diet and by increasing level of molasses in the diets feed cost was reduced slightly and feeding and increase profit 7.5% molasses reduced cost versus control. It has been known that feed is the major item of cost in poultry production; and feed cost per unit product is considered to be the most important index of economic efficiency in poultry enterprises. Further studies are needed to assess the effect of dietary molasses on broiler. Molasses (source of energy) is relatively energy source of high nutritive value than can be included in broiler ration for both safety and lowering the cost.
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