EFFECT OF USING POTATO CHIPS BY-PRODUCT AS INGREDIENT IN GOLDEN MONTAZH CHICKEN DIETS

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(Received 5/9/2023, accepted 3/12/2023)

SUMMARY

An experiment was carried out to determine the effects of adding potato chips by-product (PBP) to Golden Montazh chick's diets (starter and finisher) on productive performance, carcass characteristics, and economic evaluation.

Five levels of PBP representing 0.0 (control), 2.5, 5.0, 7.5 and 10.0% were used during starter (0-6 weeks) and finisher (7-10 weeks) in five dietary treatments (T1-5). 225 one day old unsexed of Golden Montazh chicks were divided equally into 5 dietary treatments in 3 replicates of 15 chicks each. All birds are kept under the same condition. Feed and water were supplemented ad-libitum. Three birds from each treatment were randomly chosen at the conclusion of the experiment, slaughtered, and their carcasses were measured, and their meat samples were taken. Results revealed no significant differences between treatments in live body weight, body weight gain, feed consumption, or feed conversion ratio.

The percentages of carcass and total edible parts (TEP) were increase significantly when chicks fed diets containing 7.5% PBP compare with control (T1); however, the percentages of liver, gizzard, heart, or total giblets hadn't affected by different treatments. Chemical composition of meat (protein, ether extract, and ash) as percentages on dry matter basic showed that ash% hadn't affected by different treatments, on the other hand, ether extract % increase significantly in all treated groups compare with control and the opposite was recorded in crude protein%. The results of economical evaluation showed that potato chips by-product could be included at 2.5 and 5% in chicks' diets to support and enhance economic efficiency.

Conclusion: From the present results it could be stated that adding potato chips by-product at inclusion rate of 5% to Golden Montazh diets as a replacement of yellow corn, would have a positive effect on economic efficiency without any adverse effect on productive performance or carcass traits.

Keywords: *Local chicken, Golden Montazh, performance, potato chips by-product, economic efficiency*

INTRODUCTION

Indigenous chicken breeds are a valuable source of high-quality animal protein for rural economies in developing nations. However, there are few research evaluating the economic characteristics of native Egyptian breeds (El-Attrouny *et al.*, 2021). The Montazah Poultry Research Farm in Montazah, Egypt, is credited with creating the breed known as Golden Montazah chickens. By crossing a Rhode Island Red with Dokki 4, another evolved breed, the Golden Monatzah (Mahmoud *et al.*, 1974) was created. The indigenous Fayoumi breed, and a Barred Plymouth Rock were used to create the Dokki 4 (El-Itriby and Sayed, 1966). This breed still maintains several desirable traits, including excellent environmental adaptation, disease resistance, and excellent meat flavour and taste (El Nagar and Ibrahim, 2007).

Poultry feed cost is the highest cost (70:80% of total cost) in poultry production (Ayuk and Essien, 2009). Where the problem of the research is summarized in the importance of yellow corn in feeding animals, especially poultry, in addition to what Egypt has been witnessing in the recent periods since October 2020 in terms of a rise in the prices of poultry and eggs, and this is due to the fact that the deficit in the local production of yellow corn naturally leads to an increase in Egyptian imports from it, Egypt is the fourth in the world in

importing yellow corn, with an estimated average quantity of about 10.32 million tons of the world's total imports of yellow corn during the period (2016-2020), representing about 6% of the world's total imports of it for the same period, which It makes Egypt one of the countries most affected by global changes in the form and content of the global market for yellow corn (Ryad, 2021). Livestock must use fewer resources to meet the rising demand for food and feed due to the decreasing availability of farmland, climate change, and the threat of shrinking water resources. Reduced rivalry between animal and human nutrition may result from the use of food waste as sustainable ingredients in feed formulations for both ruminants and monogastric animals (Pinotti *et al.*, 2021). On the other hand, the traditional feed ingredients became so expensive, so it is necessary to find new feed sources for animal and poultry production. Also, human food factories produce a large amount of by-products unfit for human consumption, so it could be used in poultry feed. One of these by-products is potato chips by-product. Mozafari *et al.* (2013) reported that potato is considered one of the high energy foods and is the strategy crop of some countries. Fresh Potato contains approximately 20-25% dry matter with 12% crude protein (CP). Potato meal can be used as an energy source in poultry feed where its energy value of more than 2830 ME per kg and it contains more than 65% starch, 12.72% CP, 23.48% crude fiber (CF), 6.74% ash, and 0.99% ether extract (EE) on dry matter (DM) basis (Shakib *et al.*, 2014). Crud protein in potato contains a high amount of amino acids except tryptophan and sulphur-containing amino acids where their contents are limiting (Morrison, 1961).

In some studies, using potato (Solanum tuberosum L.) tuber meal (PTM) in poultry feed found that it can be replaced partially from corn in the diet of broilers (D'Mello *et al.*, 1973; Whittemore *et al.*, 1975 and Mozafari *et al.*, 2013). Sakib *et al.* (2014) fed diets consisting of 0, 5, 10 and 15% raw PTM to broilers (up to 42 days) and found that body weight gain (BWG) improved insignificantly with increase potato percentage in diets. Also, Mozafari *et al.* (2013) fed broiler chicks diets with different level of potato in diets (0, 25 and 35%) at 42 day of age and found that performance of chicks hasn't affected by different level of potato in diets. On the other hand, Adami *et al.* (2016) replace corn with PTM at 0, 10, 20, 30, 40 and 50% from corn in diets and found that feed intake, BWG and feed conversion ratio (FCR) had no affect by replacement at levels 10, 20, 30 and 40%, however, BWG decreased significantly ($P \leq 0.05$) at replacing 50% from 22 to 42 and 22 to 49 days of age.

Therefore, the present work was undertaken to evaluate and compare the differences in productive performance, carcass traits, meat quality and economic efficiency of local strain (Golden Montazh) fed diets with different levels of potato chips by-product meal.

MARTIALS AND METHODS

This experiment was carried out in a poultry farm of Agriculture experiments and research station at shalakan of the faculty of Agriculture, Ain Shams University during Feb. to Apr 2022. Experimental design and protocol within this study were conducted according to ethical guidelines approved by the Experimental Animal Care and Research Ethics Committee of Ain Shams University, Agriculture Sector Committee (Approval No 5-2023-4).

Potato chips by product (PBP) preparation:

Potato chips by product was collected as waste from Egypt Man company for food industries – 6 October City, Giza). The experiment PBP was crushed in hammer mill to 3 mm in size without any special treatments (physical or chemical).

The proximate chemical content of yellow corn ingredient, PBP, and meat were analyzed for DM, CP, EE, crude fiber (CF and ash content according to A.O.A.C. (2012). Also, fatty acid profile of fat in tested materials (PBP) was trans esterified into their corresponding FAMEs using methanolic NaOH and Boron trifluoride (BF3) with methanol described by A.O.A.C. (2012). The fatty acid methyl esters (FAME) were quantified by Shimadzu Gas Chromatograph Series 2010 equipped with a 2010+S autosampler (Japan,) and interfaced with a flame ionization detector (FID) as shown in Tables (1 and 2) .

Five experimental starter and finisher diets were in which the first one (T1) was corn-soybean diets and served as a control. In other diets yellow corn was replaced by potato chips by-products (as a percentage of the

diets) at four levels 2.5, 5.0, 7.5 and 10.0 % (T2 T3 T4 and T5). Replaced all diets were adjusted to be iso-nitrogenous and iso-caloric. Treatments: was containing 225 Golden Montazh chicks one-day old were divided randomly into 5 treatments; each treatment contained 3 replicates (15 bird each). Birds were reared on the floor heated by gas heaters under similar conditions of management till 10 weeks of age.

The experimental treatments were as follow:

- T1 (basal diet 0.0% PBP as a percentage of the diets).
- T2 (diet with 2.5% PBP as a percentage of the diets).
- T3 (diet with 5% PBP as a percentage of the diets).
- T4 (diet with 7.5% PBP as a percentage of the diets).
- T5 (diet with 10% PBP as a percentage of the diets).

Table (1): Chemical composition of potato chips by-product used in the experimental diets in comparison with yellow corn.

Chemical analysis%	Potato chips by-product	Yellow corn
Moisture	4.80	12.00
Dry Matter	95.20	88.00
Crude Protein	7.30	7.70
Ether Extract	29.00	3.80
Crude Fiber	1.57	2.30
Ash	5.41	1.40
Nitrogen-Free Extract*	51.92	72.80
Apparent metabolizable energy**	3472	3350

** Nitrogen-free extract = 100 – (% humidity + % ether extract + % crude fiber + % crude protein + % ash).*

***Apparent metabolisable energy (kcal/kg DM) for test material = 8.62 crude protein + 50.12 ether extract + 37.67 nitrogen-free extract (Janssen 1989)*

Table (2): Fatty acids composition of potato chips by-product used in the experimental diets.

Fatty acid	Shorthand	Potato chips by-product%
C16:0	Palmitic acid	30.69
C18:0	Stearic acid	4.11
C18:1n9	Oleic acid	37.16
C18:2n6	Linoleic acid	20.10
C18:3n3	Linolenic acid	0.43
C20:0	Arachidic acid	0.36
SFA	Saturated fatty acid	40.31
MUSFA	Monounsaturated fatty acid	38.36
PUSFA	Polyunsaturated fatty acid	20.89

Diets were formulated to meet the requirements of local chicken strain (CLFF 2001). The composition and nutrient content of diets according to NRC (1994) were presented in Table (3). The productive performance included live body weight (LBW) and feed consumption (FC) which were determined at the end of starter and finisher periods and taken BWG and (FCR were calculated.

At the end of experiment (10 weeks of age), three birds of each treatment were taken randomly and slaughtered to estimate carcass characteristics, and meat quality (meat composition).

The economic evaluation and production cost analysis was carried out for all treatments in attempt to investigate the effect of different dietary treatments of feeding cost (Bayoumi, 1980)

Statistical analysis:

Statistical analysis of data obtained from the present study was conducted using the general linear model (GLM) procedure of SAS® (SAS, 2004). By applying for a test using one-way ANOVA. Means were

compared using Duncan´s range test (Duncan, 1955) where the level of significance was set at minimum (P≤0.05), and the statistical model was performed as follows:

$$Yij = \mu + Ti + Eij$$

Where:

Yij=the observation
μ=overall mean
Ti=the effect of treatment
Eij=random error.

Table (3): Composition and calculated chemical analysis of experimental diets

Ingredients	Starter (0-6 weeks)					Finisher (7-10 weeks)				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
Yellow corn	64.15	61.65	59.15	56.65	54.15	72.43	69.93	67.43	64.93	62.43
Soybean meal 48%	29.20	29.20	29.20	29.20	29.20	22.00	22.00	22.00	22.00	22.00
Corn gluten meal 62%	3.00	3.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00	2.00
Potato by-product	0.00	2.50	5.00	7.50	10.00	0.00	2.50	5.00	7.50	10.00
Di Calcium Phosphate	1.90	1.90	1.90	1.90	1.90	1.70	1.70	1.70	1.70	1.70
Limestone	1.05	1.05	1.05	1.05	1.05	1.07	1.07	1.07	1.07	1.07
Premix*	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Salt	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
DL Methionine	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
HCL Lysine	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.10	0.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Calculated chemical analysis**										
ME	2972	2975	2978	2982	2985	3037	3040	3043	3046	3050
CP	20.99	20.98	20.97	20.96	20.95	17.51	17.50	17.49	17.48	17.47
C/P Ratio	141.60	141.82	142.05	142.27	142.50	173.45	173.74	174.03	174.32	174.61
Lysine	1.13	1.13	1.12	1.11	1.11	1.02	1.01	1.00	0.99	0.99
Methionine	0.53	0.52	0.52	0.51	0.51	0.48	0.47	0.47	0.46	0.46
Meth + Cys	0.83	0.82	0.82	0.81	0.81	0.73	0.72	0.71	0.70	0.70
Ca%	0.90	0.90	0.90	0.90	0.90	0.85	0.84	0.84	0.84	0.84
A.P.%	0.50	0.49	0.49	0.49	0.49	0.45	0.44	0.44	0.44	0.44

** Each 3 kg contains: Vit A 12 000 000 IU, Vit D3 2 000 000 IU, Vit E 1g, Vit K3 2 g, Vit B1 1 g, Vit B2 5 g, Vit B6 1.5 g, Vit B12 10 mg, Nicotinic acid 30 g, Pantothenic acid 10 g, Folic acid 1 g, Biotin 50 mg Choline chloride 250 g, Iron 30 g, Copper 10 g, Zinc 50 g, Manganese 60 g, Iodine1 g, Selenium 0.1 g, Cobalt 0.1 g and carrier (CaCO3) to 3 kg: ** Calculated analysis chemical according to NRC (1994).*

RESULTS AND DISCUSSION

Chemical analysis and nutritive value of PBP:

Results of proximate analysis of PBP used in the experiment in comparison with yellow corn were summarized in Table (1). The experimental data showed that yellow corn was the higher in crude protein (7.7%), while PBP was the lowest (7.3%). Ether extract and ash were relatively higher in PBP than those found in corn (29.0 vs. 3.8% and 5.4 vs. 1.4%) respectively. While nitrogen free extract (NFE) was higher in corn (72.80%) than found in PBP (51.92%). Ether extract and contents of PBP indicate a possibility of using it to replace corn partially as an energy source in poultry diets. On the other hand, the fatty acids composition of PBP was summarized in Table (2) showed that the largest amount in PBP was oleic acid (37.16%), followed by palmitic acid (30.69%), linoleic acid (20.10%), lauric acid (4.28) and stearic acid (4.11%). While the amount of other fatty acids in PBP was found to be 2%.

Productive performance:

The results in Table (4) and figures (1, 2 and 3) showed the effects on different concentrations of potato by-product in diets on LBW, BWG, FC and FCR at 10 weeks old. The data in table showed that there was increase in LBW and BWG in all treated groups (T2-5) compared with control (T1), but this increase failed to be significant. The same results recorded by Shakib *et al.* (2014) who used potato meal at levels 0.0, 5.0, 10.0, and 15 g/kg in broiler diets at 42 days old and that LBW hasn't affected significantly by treatments. On the other hand, Adami *et al.* (2016) reported that BWG decreases significantly when 50% is replaced by potato meal.

There was insignificant increase in FC with increase potato by-product using in local strain diets. Also, FCR hasn't been affected by different treatments. These results agree with Mozafari1 *et al.* (2013) when replaced corn by cooked and raw potato at percentage 25 and 35% from corn percentage at 42 days old and that FC hasn't affected significantly by treatments. Also, FCR hasn't been affected significantly by treatments. This date is similar with which found by Rahnema *et al.* (2004) when added potato chip scraps (PCS, 0, 5, 7.5%) in broiler diets.

Mortality rate for all treatments was in a normal range around all periods. The same result was recorded by Hulan *et al.* (1982).

Table (4): Effects of using different levels of potato chips by-product meal(PBP) in Golden Montazh chicken diets on live body weight (LBW), feed consumption (FC), body weight gain (BWG) and feed conversion ratio (FCR) at different periods of age.

Items		Treatments						
		0%PBP (T1)	2.5%PBP (T2)	5%PBP (T3)	7.5%PBP (T4)	10%PBP (T5)	SE	Sig
LBW (g)	0 week	34.90	33.80	34.43	34.60	34.47	0.59	NS
	6 weeks	348.10	379.67	379.30	370.33	391.57	43.18	NS
	10 weeks	743.67	784.67	805.63	783.57	811.60	35.89	NS
BWG (g)	0-6 weeks	313.20	345.87	344.87	335.73	357.10	43.24	NS
	7-10 weeks	395.57	405.00	426.33	413.23	420.03	49.44	NS
FC (g)	0-6 weeks	1247.67	1282.67	1294.00	1265.33	1345.33	68.62	NS
	7-10 weeks	1606.67	1534.33	1548.00	1638.67	1737.33	122.01	NS
FCR (g feed/ g gain)	0-6 weeks	4.21	3.71	3.77	3.77	3.79	0.64	NS
	7-10 weeks	4.27	3.81	3.66	3.98	4.13	0.71	NS
Mortality (%)	0-6 weeks	1.00	0.67	1.33	0.00	1.00	0.73	NS
	7-10 weeks	1.67	1.67	0.33	1.33	0.00	0.81	NS
	overall	2.67	2.33	1.67	1.33	1.00	1.18	NS

NS: not significant,

Carcass traits:

Table (5) and figure (4) showed a significant increase in percentages of carcass and total edible parts (Carcass % + Giblets %) in treated T4 and T5 compared with control. This result may be related to the high value of ether extract in potato convert to fat which deposed in tissues. However, percentages of liver heart, gizzard and giblets didn't differ significantly between treatments. These results agree with which found by Makled *et al.* (2019) when supplemented chicken diets with potato chips scraps (PCS), potato starchy waste (PSW) at levels 5 and 10%. Also, Tork *et al.* (2011) added potato by-products to the broiler diets at 8, 16 and 24 % of the diet. chicken diets on Carcass traits at 10 weeks of age.

Table (5): Effects of using different levels of potato chips by-product meal (PBP) in Golden Montazh

Items%	Treatments					SE	Sig
	0%PBP (T1)	2.5%PBP (T2)	5%PBP (T3)	7.5%PBP (T4)	10%PBP (T5)		
Carcass	62.37^{b}	61.83^{b}	62.63^{b}	66.47^{a}	64.47^{a}	1.50	*
Liver	2.08	2.14	1.96	1.74	1.91	0.35	NS
Heart	0.40	0.46	0.48	0.46	0.55	0.05	NS
Gizzard	2.02	2.50	2.22	2.18	2.21	0.43	NS
Total Giblets **	4.50	5.09	4.65	4.38	4.67	0.69	NS

*NS: not significant, * Significant at (P≤ 0.05),*

a, and b means in the same column having different letters are significantly different at (P≤0.05)

***Totale Giblets % = liver% + gizzard% + heart%*

Meat composition:

Table 6 showed the chemical composition of meat where it appears that ash% wasn't affected by different treatments but EE% increased significantly in all treated groups compared with control. This result may be related to the high value of ether extract in PBP converted to fat which is deposited in tissues.

Table (6): Effects of using different levels of potato chips by-product meal (PBP) in Golden Montazh chicken diets on meat composition at 10 weeks of age

Items%	Treatments					SE	Sig
	0%PBP (T1)	2.5%PBP (T2)	5%PBP (T3)	7.5%PBP (T4)	10%PBP (T5)		
Ash	4.55	4.16	4.13	3.77	4.17	0.59	NS
EE	7.39^{c}	10.95^{ab}	8.92^{bc}	10.04^{ab}	12.94^{a}	1.55	*
CP	88.13^{a}	84.93^{bc}	86.93^{ab}	86.17^{ab}	82.90^{c}	1.47	*

*NS: not significant, * Significant at (P≤0.05)*

a, b and c: means in the same column having different letters are significantly different at (P≤0.05).

So that CP% significantly decreased in all treated groups compared with control. Because there was no previous research demonstrating the nutritious content of the meat from the current PBP study, no comparison could be established. These kinds of details for future use will be provided by the study's findings.

Economic evaluation:

The result for economic evaluation of local chicken at 10 weeks of age is summarized in Table 7. It should be pointed out that the economic efficiency values were calculated according to the prevailing market prices for feed ingredients and broiler LBW at the time of the experimental period.

Table (7): Effects of using different levels of potato chips by-product meal (PBP) in Golden Montazh chicken diets on economic efficiency at 10 weeks of age

Items	Treatments				
	0%PBP (T_1)	2.5%PBP (T_2)	5%PBP (T_3)	7.5%PBP (T_4)	10%PBP (T_5)
Feed Cost / Bird (LE)	17.84	18.31	19.18	20.33	22.35
Total Cost / Bird (LE) 1	22.84	23.31	24.18	25.33	27.35
Total Return Bird (LE) 2	33.47	35.31	36.25	35.26	36.52
Net Return / Bird (LE)	10.63	12.00	12.07	9.93	9.17
Economic Efficiency 3	46.52	51.48	49.91	39.22	33.54
Relative Economic Efficiency	100.00	110.66	107.92	84.31	72.10

1 Total cost = (feed cost + price of one-day live chicks + incidental costs); L.E.: Egyptian Pound
. 2 Total return According to the local price of Kg sold live birds was 45.00 L.E
3 Economic efficiencies = net return/total feed cost × 100. Whereas net revenue= total return - total feed cost. Assuming that the relative economic efficiency of the control group equals 100.

Economically, all treated groups were better than the control where Relative Economic Efficiency increase in all treatments compared with control where chicken in T2-3 recorded the best REE value than, T4, T5 and control respectively.

CONCLUSION

In conclusion, it could be using potato chips by-product in Golden Montazh chicks' diets at level 5% because it could achieve the best relative economic efficiency without any adverse effects on performance, and carcass traits.

REFERENCES

A.O.A.C. (2012). Association of Official Analytical Chemists Official Methods of Analysis, 19th Ed. Gaithersburg, USA.

Adami S. A., Sadeghi G.A.B. Karimi A.A., Azizi O.A. and Habibian M.A. (2016) Effects of replacement of corn with potato (Solanum tuberosum L. tuber meal in broiler chicken diets. Anim. Prod. Sci., online 8 March.

Ayuk E.A. and Essien A. (2009). Growth and haematological response of broiler chicks fed graded levels of sweet potato (Ipomoea batata) meal as replacement for maize. Int. J. Poult. Sci., 8: 485-488.

Bayoumi S.B. (1980). Effect of different ration on egg production of feeding hens. M.Sc. Thesis, Fac. Agri. Kafr El-Sheikh, Tanta Univ. Egypt.

CLFF (2001). Central lab for feed and food. Technical Bulletin No. (1). Feed composition tables for animal and poultry feedstuffs used in Egypt, Ministry of Agriculture, Egypt.

D'Mello J.P.F., Whittemore C.T. and Elsley F.W.H. (1973) The influence of processing upon the nutritive value of the potato: studies with young chicks. J. of the Sci. of Food and Agric., 24: 533–537.

Duncan D. B. (1955). Multiple range and multiple F test. Biometrics 11: 142.

El Nagar A. and Ibrahim, A. (2007). November. Case study of the Egyptian poultry sector. In Proceedings of the International Poultry Conference (Vol. 31).

El-Attrouny M.M.; Iraqi M.M.; Sabike I.I.; Abdelatty A.M.; Moustafa M.M. and BadrO.A. (2021). Comparative evaluation of growth performance, carcass characteristics and timed series gene expression profile of GH and IGF-1 in two Egyptian indigenous chicken breeds versus Rhode Island Red. J. Anim. Breed Genet. (138):463–473.

El-Itriby A.A. and Sayed I.F. (1966). Dokki 4, a new breed of poultry. Agric. Res. Rev. Cairo, Vol.,44 (4): 102-109

Hulan H. W., Proudfoot F. C. and Zarka C. C. (1982) Potato waste meal. ii. the nutritive value and quality for broiler chicken. Can. J. Anim. Sci., 62: llTl-1180

Janssen W.M.M.A (1989) 'European table of energy values for poultry feedstuffs.' (Spelderholt Center for Poultry Research and Information Services: Beekbergen, Netherlands).

Mahmoud T.H.; Sayed I.F. and Madkour, Y.H. (1974). "The Golden Montazah", a new variety of chicken. Agric. Res. Rev. Cairo, Vol.,52 (7): 51.

Makled M.N., Sharara H.H., Galal A.E.and Sayed A.M. (2019). Impact of food industry byproducts and wastes on broilers performance. Egypt. Poult. Sci., J. Vol. (39) (I): (275-290).

Morrison F.B. (1961). Feeds and Feeding. Morrison Publishing Co., Iowa.

Mozafari O, Ghazi S and Moeini M.M. (2013) The effects of different levels of edible potato (Solanum tubresum) replacing maize on performance, serum metabolite and immune system of broiler chicks. Iranian J. of Appl. Anim. Sci., 3: 583–588.

National Research Council, NRC (1994). Nutrient Requirements of Poultry. 9th revised edition. National Academy Press. Washington, D.C., USA.

Pinotti L.; Luciano A.; Ottoboni M.; Manoni M.; Ferrari L.; Marchis D. and Tretola M. (2021). Recycling food leftovers in feed as opportunity to increase the sustainability of livestock production. J. of Cleaner Prod. 294 : 126290

Rahnema S., Lilburn M. and Nixon J. (2004). Potato Chip Scraps in Diets for Broiler Chicks. J. Appl. Anim. Res. 25 : 1-4.

Ryad, M.K. (2021). An economic study of the world yellow corn market with reference to the Egyptian yellow corn market. Alex. Sci. Exchange J., Article 31, Vol. (42)(4):1999-2012.

Sakib N., Sultana F., Howlider M.A.R. and Rana M.S. (2014) Effect of potato (Solanum tuberosum) meal on broiler production. Bang. J. Anim. Sci. 2014. 43 (3): 192-196.

SAS. (2004). SAS procedure Guide, Version 6.12 th. SAS Institute, Cary, NC., USA.

Shakib N., Sultana F., Howlider M.A.R.and Rana M.S. (2014) Effect of potato (Solanum tuberosum) meal on broiler production. Bangladesh J. of Anim. Sci., 43:192–196. doi:10.3329/bjas.v43i3.21647 SAS Institute (2003) 'User's Guide. Release 9.1.' (SAS Institute Inc.: Cary, NC).

Tork D. M.; El-Serwy A. A.; El-Shenawy M.M.; Hamza A S. and Abdel-Moneim M.A. (2011) Effects of graded levels of potato by-product and tomato pomace on the performance and carcass characteristics of broiler chickens. J. Anim. and Poult. Prod., Mansoura Univ., Vol. 2 (9): 361–373.

Whittemore C.T., Moffat I.W., Taylor A.G. (1975-) The effect of dietary cooked potato flake on performance of broilers and on litter quality. Br. Poult. Sci., 16: 115–120.

تأثير استخدام المنتج الثانوي لرقائق البطاطس كمكون في علائق دجاج المنتزه الذهبي

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أجريت تجربة لتحديد تأثير إضافة المنتج الثانوي لرقائق البطاطس (PBP) إلى علائق كتاكيت المنتزة الذهبي (البادئ والناهى) على الأداء الإنتاجي وخصائص الذبيحة والتقييم الاقتصادي. تم استخدام خمسة مستويات من (PBP) تمثل 0.0٪ (مجموعة تحكم) و 2.5٪ و 5.0٪ و 7.5 و 10.0٪ خلال البداية (0-6 أسابيع) والمرحلة النهائية (7-10 أسابيع) في خمسة معاملات غذائية (T1-5) . تم توزيع 225 كتكوت المنتزه الذهبي غير مجنس بعمر يوم واحد بالتساوي على 5 معاملات غذائية في 3 مكررات لكل منها 15 طائرا. تم تربية الطيور في نفس الظروف. تم توفير العلف والماء حسب الرغبة. فى نهاية التجربة تم اختيار ثلاثة طيور من كل معاملة عشوائياً وذبحها وأخذ عينات لحومها.

كشفت النتائج عن

1. عدم وجود فروق معنوية بين المعاملا في LBW، BWG، FC، أو FCR.
2. زادت نسب الذبيحة وإجمالي الأجزاء الصالحة للأكل زيادة كبيرة عند تغذية الكتاكيت على أعلاف تحتوي على 7.5٪ (PBP) مقارنة مع مجموعة التحكم (T1) ؛ ومع ذلك ، فإن النسب المئوية للكبد أو القانصة أو القلب أو الأجزاء الماكولة الكلية لم تتأثر بالمعاملات المختلفة.
3. أظهرت التركيب الكيميائي للحوم (البروتين ، ومستخلص الأثير ، والرماد) كنسب مئوية على أساس المادة الجافة أن: نسبة الرماد لم تتأثر بالمعاملات المختلفة ، ومن ناحية أخرى ، فإن مستخلص الأثير يزيد بشكل ملحوظ في جميع المجموعات المعاملة مقارنة مع مجموعة التحكم و تم تسجيل العكس في نسبة البروتين الخام.
4. أظهرت نتائج التقييم الاقتصادي أن المنتج الثانوي لرقائق البطاطس يمكن إدراج بنسبة 2.5 و 5٪ في علائق الكتاكيت لدعم وتعزيز الكفاءة الاقتصادية.

الخلاصة: من النتائج الحالية يمكن القول أن إضافة المنتج الثانوي لرقائق البطاطس بنسبة 5٪ إلى علائق المنتزة الذهبية كبديل للذرة الصفراء، سيكون له تأثير إيجابي على الكفاءة الاقتصادية دون أي تأثير سلبي على الأداء الإنتاجي أو صفات الذبيحة