FACULTY OF AGRICULTURE

Minia J. of Agric. Res. & Develop.
Vol. (44), No. 2 , pp.193-206, 2024

THE IMPACT OF DIETARY PUMPKIN SEED OIL ON PRODUCTIVE PERFORMANCE, SOME CARCASS TRAITS, AND BLOOD ASPECTS OF GROWING QUAILS

S. A. Abd-El latif, M. A. Toson , A. A. Sayed and Abdelhameed S.A. Mohamed
Animal and Poultry Production Department, Faculty of Agriculture,
Minia University, El Minia ,Egypt.

Received : 4 March 2024 Accepted: 8 April 2024

ABSTRACT:

This work was carried out to evaluate the impact of inclusion of graded levels of Pumpkin seed oil (PSO) in Japanese quail diet as feed additive on performance, Some carcass traits and blood aspects. Three hundred one day-old, unsexed quails (Japanese) chicks were randomly partition in four treatments. Every treatment had 3 replicates of 25 chicks, The treatment one fed the basal diet (with no PSO supplementation). However, 2nd, 3rd and 4th treatment groups were fed diets combined with graded levels of PSO, 0.2, 0.4 and 0.6 % of diet, respectively as feed growth promoters. The data showed, no effect (P>0.05) in body weight (BW), body gain (BG), feed consumption (FC), feed conversion ratio (FCR) and some carcass traits. Birds fed dietary 0.2% of PSO supplementation presented numerically but not significantly enhancement in BW, BWG, FC, or the percentages of gizzard and edible parts in comparison to other treatments. The control group is for comparison and not to be superior to other treatments. Quails fed dietary 0.6% of PSO supplementation showed the (P≤0.01) highest total protein concentration of all dietary treatments, while quails fed dietary 0.4% of PSO supplementation recorded the lowest (P≥0.01) values of triglycerides. Adding PSO to quails diet at all levels reduced (P≥0.01) HDL and GPT but values were within normal physiological levels.

Key words:-Pumpkin seed oil, Japanese quail, performance, carcass traits, blood aspects.

INTRODUCTION:

The fast growth in the poultry industry and the production improvement efficiency have led to a rise in the use of feed supplements, which have become widely available in poultry diets for many years. The positive impacts of vegetal additives in farm animals can branch from their influence on improving FI and digestive secretions, stimulating the system of immune, revealing antibacterial, antihelminthic, coccidiostatic, antiviral, or anti-inflammatory activities. Within

plant tissues, pH values are influenced by the occurrence of poly-carboxylic acids, fiber, phosphate salts, and proteins **(Al-Dabbas et al., 2010).** Positive botanical specimens, enriched with a spectrum of essential oils, have attention as substitute therapeutic agents among researchers. Essential oils, otherwise named vegetable oils, manifest as aromatic, oily solutions drived from plant i.e. flowers, buds, seeds, leaves, twigs, wood, fruits, bark, herbs, and roots. The accumulative significance of oil-producing botanicals remains in their capacity as natural promoters, recognized to their antimicrobial efficiency and their capacity to stimulate the digestive systems of animal **(Valero and Salmeron, 2003).** Hence, adding the extraction of essential plant oil into poultry feeding systems holds significant position, attributed to their attractive and digestion-stimulating attributes, along with their antimicrobial possessions, acting as essential feed supplementations in live avian species. **(Ciftci et al., 2005 ; Ocak et al., 2008).**

Oils of plants, rich in unsaturated fatty acids, undergo more thorough digestion by birds compared to animal fats. Pumpkin seeds are documented for their high oil content (37.8-45.4%) and protein content (25.2-37%). Gas-liquid chromatography (GLC) analysis of the fatty acid of PSO exposed that the major unsaturated fatty acids were, linoleic (42%) and oleic (38%), whereas palmitic (12.7%) and stearic (6%) were the major saturated fatty acids **(Tsaknis et al., 1997and Esuoso et al., 1998)**. the saturated fatty acids in pumpkin oil contain amounted to 27.73%, as well as 16.41% palmitic acid and 11.14% stearic acid. Also, the unsaturated fatty acids founded 73.03%, predominantly comprising 18.14% oleic acid and 52.69% linoleic acid. **Stevenson et al., (2007).**

PSO is rich in β-carotene and Vitamin E, providing strong antioxidant assets and significant protective effects against tumors. It has been acknowledged for many health benefits, including stopping the growth and reducing the size of the prostate, decreasing bladder and urethral pressure, enhancing bladder compliance, alleviating diabetes through the promotion of hypoglycemic activity, and falling the risk of gastric, lung, breast, and colorectal cancers **(Mitra et al., 2009**; **Srbinoska, M. et al., 2012).**

In addition, PSO is rich in antioxidants, polyunsaturated fatty acids, β-carotenes, EFA, gamma-lutein, and selenium **(ALZuhairu et al., 2000).** Pumpkin seed extract has significant amounts of potent phytochemicals, such as sterols, known for improving the immune system and reproductive position. Moreover, it provides therapeutic assistances for numerous diseases **(Glew et al., 2006**; **Fruhwirth and Hermetter, 2007**; **Stevenson et al., 2007).** The PSO antioxidant property could improves male fertility **(Murkovic, et al.,1996).** The oil extracted from pumpkin seeds contains antimicrobial components and reveals efficiency against various bacteria. Many in vitro studies have recognized notable antimicrobial and antifungal properties associated with pumpkin seed extract oil. **(Vassiliou et al., 1998; Hammer et al., 1999; Xiong et al., 2000; Ng et al., 2002).**

The focal resolution of this study was to assessed the outcome of adding different levels (0.0, 0.2, 0.4, and 0.6 g/kg) of PSO in Japanese quail diet as growth promoters of feed additive on growth performance, some carcass traits and blood parameters.

MATERIALS AND METHODS

Chicks and housing:

This experiment was carried out in Animal and Poultry Farm, faculty of Agriculture, University of Minia, Minia, Egypt to assess the impact of graded PSO levels in Japanese quails diet on performance, carcass traits and blood aspects.

Chicks and management

Three hundred unsexed, Japanese quail, one-day old was used in this trial. Quails were distributed randomly in birdcages and kept in two-tiers flooring batteries situated in a house (open) under similar management circumstances. Artificial light was providing 23 hours every day throughout full experimental period (0-6 weeks of age). Brooding house temperature was 36° C form 0 to 3 days of age, then it was decreased 2 degrees each week till 4th week of age. Then, the temperature was reserved at 25° C till the end of experimental period. Water and feed were available all time of the experiment. Quails were distributed into 4 groups, 75 birds each. Every treatment groups had 3 replicates of 25 birds.

Diets

Chicks were allocated into 4 groups. Group one fed basal diet without accompaniments. Additional three diets were caught by combining three phases (0.2, 0.4 and 0.6g PSO /kg) by way of feed supplementation into Japanese quails diet. The arrangement of the 4 treatments groups were as follow: Basal diet l (with no addition), basal supple with 0.2g PSO/kg, basal supplemented with 0.4g PSO/kg and basal supplemented with 0.6 PSO/kg. All quails were fed either basal diet with or without PSO additions from 0 to 6 weeks of age. The composition and proximate analysis of diet is shown in Table (1).

Table (1): Ingredient and calculated composition of the basal diet.

Ingredients	%
Ground, Yellow corn	52.3
Soybean meal, 44%	32.8
Broiler concentrate, 45%[a]	10
Sunflower oil	3.5
Limestone	0.9
Premix [b]	0.25
Salt	0.25
Calculated composition	
Crude protein (CP)	24.03
ME, kcal per kg	3053.09
Calcium	1.05
Avail.Phosphorus	0.43
Methionine&Cystine	0.94

[a]corn gluten (60%), soybean meal (44%), dibasic calcium phosphate, limestone, Sodium chloride, Vitamin-mineral premix, choline chloride (60%), methionine hydroxy analogue-calcium, L-Lysine Hydrochloride *(98%)

[b]Provided perKG of diet: vit.A, 12,500 IU; vit.E, 30 IU; vit.B12, 3 mg; vit.K3, 2.3 mg; vit.D3, 4000 IU; B1, 2.2 mg; B3, 65 mg; B2, 8 mg; B6, 4 mg; B5 acid, 24.3 mg; B7, 0.25 mg; folic acid, 1.2 mg; 125.1 mg; choline, 600 mg; Fe, 60 mg; Se, 0.35 mg; Cu, 7.5 mg; Mn, 100 mg; Zn, 110 mg; I, 1.8 mg.

Performance measurements:

The live BW of all replicates noted to the nearest gm every 2 weeks during the trail stages (0 to 6 weeks of age). Feed intake and BG of the quails measured (g / quail) throughout the stages 0 - 2, 2 - 4 and 4 - 6 and 0 to 6 WKs of age. Feed conversion, considered as the quantity of diet necessary for creating a unit of BG (gm, feed/ gm, gain) all over the preceding FI and BG periods.

Carcass characters:

Demonstrative samples of quails (3 quails from each treatment groups) round regular treatment body weight mean, at the end of the study (6 WKs of age).

All birds were sacrificed, after whole bleeding, the birds scalded and feathers pulled. Carcasses filleted, shanks and heads separated, after that the carcass were laid-back in water for 10 minutes. Filleted carcasses weighed individually and dressing % was considered (carcass weight × 100 / per live BW). Percentage of edible parts (heart + gizzard + liver) and offal's considered in relative to live BW.

Collection of blood samples

At the finally of the study, 3 quails from each treatment group randomly selected and sacrifice, after six weeks from start of the treatments. Samples of blood were collected in tubes without heparinized tubes. Blood samples centrifuged for 15 minutes at 3000 rpm to isolated serum which saved at (-20C) for determined some serum elements: Liver functions i.e. (TP), (Alb.), (Glob.) and (Gluc.), liver enzymes i.e. glutamic oxaloacetic transaminase (GOT), glutamate-pyruvate transaminase (GPT), Triglycerides and Cholesterol .

Statistical Analysis:-

Data brief using Microsoft® Excel 2010 (10.2614.2625) Microsoft Egypt, mssupport@gbrands.com. Formerly, statistically data were examined using the analysis of variance using the General Linear Model (GLM) technique of Statistical Analysis System **(SAS, 1998)**. Significant effects between group were separated by Duncan's multiple variety tests **Duncan (1955).**

RESULTS AND DISCUSSIONS

The effect of treatments group on some growth performance.

Live body weight and body weight gain (BW &BWG).

The influence of dietary PSO at the levels of (0.0, 0.2, 0.4 and 0.6%) on BW and BG (gm/bird) of Japanese quails are shown in tables (2 and 3). The results revealed that, no effect (P>0.05) was noticed in BW and BG among treatments groups. Generally, at the end of study (6 WKs of age), a numerical increase but not significant progress in BW and BG for quails fed dietary PSO compared with the control diet. In addition, birds fed dietary 0.2% of PSO supplementation presented numerically increase in BW and BG in comparison with other dietary treatments groups.

The slightly enhancement in BG and BG as effect of addition PSO to quails diet as growth promoters at all levels may be due to that the vital compounds in PSO such as numerous antioxidants and useful dietary mechanisms i.e. essential fatty acids, amino acids (especially tyrosine and L

phenylalanine), ß - carotenes, lutein phytosterols (e.g. ß-sitosterol), and selenium **(Procida et al., 2013)**. PSO has antimicrobial components and is active against pathogenic bacteria. Numerous in vitro studies stated significant antifungal and antimicrobial properties of PSO **(Ng et al., 2002).**

The results of our work were in contract with the results of **Aami-Azghadi et al. (2010)** who noted that cumin essential oil (CEO) and Fermacto have no effect on performance parameters in all periods, while greater BG was noted in birds fed diet with the lowermost level of cumin essential oil (CEO) addition in the grower period. Even though, **Rabia et al. (2016)** they showed that using PSO in the feedstuff at 10 and 15 g/kg of diet exhibited a positive impact ($P<0.05$) on BG of Japanese quail during the 1 to 6 weeks period of age, when compared to additional treatments (5g PSO/kg of feed) and the basil diet group. It is important that all PSO addition had no effect on BW at 1, 3, and 6 wk- old , as well as on BG throw out the weekly periods of (1-3) and (3-6) throughout the experiment.

In contrast, **Hajati, et al., (2011)** reported that using PSO up to 10 g kg−1 DM diminished BG ($p<0.05$) compared with other treatments when they fed broiler chicks on dietary PSO at levels 0.00, 5.00 and 10.00 g kg−1 DM.

Table (2): Effect of adding pumpkin seed oil in growing Japanese quail diet on body weight BW

Items	Age, weeks	Pumpkin seed oil, %				SE	P-value
		0	0.2	0.4	0.6		
Body weight	0	6.97	6.99	7.07	7.05	0.16	NS
	2	61.76	60.61	61.75	63.13	1.03	NS
	4	152.47	150.00	153.20	153.40	2.17	NS
	6	214.93	220.47	213.47	217.67	3.91	NS

NS =Not significant ±SE =Standard error

Table (3). Effect of adding pumpkin seed oil in growing Japanese quail diet on body weight gain BWG

Items	Age, weeks	Pumpkin seed oil, %				SE	P-value
		0	**0.2**	**0.4**	**0.6**		
Body weight gain	0–2	54.79	53.63	54.68	56.08	0.99	NS
	2-4	90.71	89.39	91.45	90.27	1.48	NS
	4-6	62.47	70.47	60.27	64.27	2.78	NS
	0–6	207.96	213.48	206.40	210.61	3.84	NS

NS =Not significant ±SE =Standard error

Feed Consumption and feed conversion FC& FCR

The impacts of PSO dietary inclusion at the levels of (0.0, 0.2, 0.4 and 0.6%) on FC (g/bird) and FCR of Japanese quail throughout the experimental periods from 0 - 2, 2 - 4, 4 – 6 & 0 - 6 week-old are stated in tables (5 & 6). Results stated that, no changes (P>0.05) in FI and FC due to of adding grade levels of PSO to quails diet throughout all study period. At 6 weeks of age (the end of the study) quails fed control diet explicated a little numerically insignificant enhancement in FC compared with other birds fed on dietary PSO at all levels. As a result of insignificant enhancement (P>0.05) in BG without the similar enhancement in FI, birds fed dietary 0.2 or 0.6% PSO presented the greatest numerical FC compared with other treatments.

Our previous results are in agreement with those obtained by **Abbas, et al., (2016).** Fed Japanese quail on diets contain PSO supplementation at levels of (5, 10 and 15 g/kg of diet) they found that, less (P<0.05) FI at 15g/kg of PSO addition throughout (1-6) week period of experiment compared to other treatment. Adding 15g/ kg of PSO to the diet presented better (P<0.05) FC ratio throughout (1-3) week period while adding 10 and 15 g /kg of PSO resulted in better (P<0.05) FC ratio during (3-6) and (1-6) week period of experiment. Moreover, **Martinez et al., (2010)** established that, no effect of pumpkin seed meal (PSM) at 10% level on FI and FC, where as in study on rabbits, **Gaafar et al., (2014)** found reduction of feed consumption which reflected in best feed conversion ratio.

On contrast, **Tabari et al., (2016)** stated an increasing in FI of birds that fed diets received PSO as a result of the enhancement in the situations of the intestine leading to improved digestion, absorption and utilization of diet nutrients. Previous works **(Ramakrishna et al., 2003)**. **Hajati et al., (2011)** recorded that adding PSO up to 10 g/kg of dry matter diminished feed consumption of broiler chickens.

Table (4): **Effect of adding pumpkin seed oil in growing Japanese quail diet on feed consumption (FC)**

Items	Age, weeks	Pumpkin seed oil, %				SE	P-value
		0	0.2	0.4	0.6		
FC	0–2	126.88	122.23	119.48	122.00	5.19	NS
	2-4	253.12	257.77	260.52	258.00	5.19	NS
	4-6	309.01	298.73	306.27	290.67	7.59	NS
	0–6	689.01	678.73	686.27	670.67	7.59	NS

NS =Not significant ±SE =Standard error

Table (5): **Effect of adding pumpkin seed oil in growing Japanese quail diet on feed conversion ratio (FCR)**

Items	Age, weeks	Pumpkin seed oil, %				SE	P-value
		0	0.2	0.4	0.6		
FCR	0–2	2.32	2.28	2.19	2.18	0.09	NS
	2-4	2.79	2.88	2.86	2.86	0.06	NS
	4-6	5.00	4.24	5.09	4.52	0.23	NS
	0–6	3.32	3.18	3.33	3.18	0.07	NS

NS =Not significant ±SE =Standard error

Carcass traits.

The influence of dietary PSO supplementation at grade levels (0.0, 0.2, 0.4 and 0.6%) on intact weights of some carcass traits and its percentages as a percent of live BW for growing Japanese quails at the finale of the study (6 WKs of age) are shown in Tables (6 and 7) .

Data revealed that, there were no effect (P>0.05) detected in weights or proportions of all traits studied in the current work between all treatments groups. The highest numerical (p>0.05) carcass, liver and edible weights were noted for quails fed 0.6% PSO supplementation compared with other treatments groups. Hence, The best (p>0.05) gizzard weight was reported for quails fed basil diet in comparison of other treatments groups (Table 6). Birds fed control diet recorded the greatest (p>0.05) numerically dressing % (carcass%) and edible %, whereas, the best numerically gizzard was calculated for birds fed diet contain 0.2% PSO supplementation. Even though, quails fed dietary 0.6% PSO presented the greatest numerically liver% values (Table 7).

The present results were in harmony with **Abbas, et al.,(2016)** fed Japanese quail on diets contain PSO supplementation at levels of (5, 10 and 15 g/kg of diet) they created that dressing % and weights of gizzard, heart, liver, giblets, edible meat, thigh and breast not affect respecting all treatments. Nevertheless, dietary PSO at 10 and 15 g/kg of diet caused significantly (P<0.05) enhancement in carcasses weights. Furthermore, **Martinez et al., (2010)** found no effects were shown among 0 and 10% levels of pumpkin seed meal (PSM) on carcass, breast and thigh weights but abdominal fat was lower in the dietary treatments with 10% PSM. While, **Hajati et al., (2011)** create no effective result of adding PSO on abdominal fat pad and carcass composition in broiler. In addition, **Tabari et al., (2011)** find no effect of dietary treatments of PSO on carcasses weights, carcasses yield and gizzard except for thigh weights. On contrast, **Gaafar et al., (2014)** stated that rabbit fed diets incorporated with mixture of pumpkin and black seeds oils (2.5 and 2.5 g/kg diet) presented the best results concerning carcasses trait.

Table (6): Effect of adding pumpkin seed oil in growing Japanese quail diet on intact weights of some carcass characters

Items	Pumpkin seed oil, %				SE	P-value
	0	0.2	0.4	0.6		
Live body weight, LBW (g)	234.67	228.33	245.33	256.17	8.78	NS
Carcass,	168.89	165.33	166.50	182.00	5.40	NS
Heart,	1.67	1.00	1.00	1.25	0.29	NS
Gizzard,	4.56	4.33	3.83	4.17	0.32	NS
Liver,	5.78	4.67	6.50	6.92	0.69	NS
Edible,	12.00	10.00	11.33	12.33	1.09	NS

NS =Not significant ±SE =Standard error

Table (7): Effect of adding pumpkin seed oil in growing Japanese quail diet on some carcass characteristics percentages

Items	Pumpkin seed oil, %				SE	P-value
	0	0.2	0.4	0.6		
Live body weight, LBW (g)	234.67	228.33	245.33	256.17	8.78	NS
Carcass, %	73.36	71.04	67.87	71.13	1.44	NS
Heart, %	0.56	0.70	0.41	0.49	0.11	NS
Gizzard, %	1.85	2.02	1.56	1.63	0.13	NS
Liver, %	2.46	2.19	2.67	2.70	0.26	NS
Edible,%	5.03	4.42	4.64	4.82	0.37	NS

NS =Not significant ±SE =Standard error

Effect of pumpkin seed oil on some biochemical blood parameters.

The influence of PSO supplementation at the level of 0.2, 0.4, and 0.6% on some blood biochemistry i.e., total protein ،(TP) gm/dl, albumin (Alb.), g/dl, globulin (Glob.)gm/dl, liver enzymes GOT (IU/L), GPT (IU/L), cholesterol (mg/dl) , glucose (glc.),mg/dl, HDL- cholesterol (mg/dl) and triglyceride (mg/dl) at 6 wks of age are reported in Tables (8 and 9).

Results presented that quails fed dietary 0.6% of PSO supplementation presented the greatest ($P \geq 0.01$) increased in total protein compared with other dietary treatments, while, there was no significant response was detected on albumin, globulin and GOT due to incorporating PSO supplementation in quails diet. Even though, the best ($P \geq 0.01$) values of GOT was recorded for birds fed diets contain PSO at all levels compared with control diet (table 8). The lowest ($P \geq 0.01$) values of HDL was noticed when birds fed diets contain PSO at all levels compared with control diet. While, birds fed 0.6% PSO supplementation recorded the lowest ($P < 0.01$) value of triglycerides in comparison to other treatment groups. No effect ($P > 0.05$) was shown in cholesterol and glucose values as a result

of using PSO supplementation in Japanese quails diets (table 9).

The enhancement on some biochemistry aspects as a result of feeding Japanese quails on PSO may be due to that most of the plant parts contain vital compounds as antibacterial, antiviral, antiparasitic, antifungal properties and has antihypertensive, hypoglycemic, antithrombotic, antihyperlipidemic, anti-inflammatory and antioxidant activity **(Lampe, 1999)**.

Our results were barreled to the finding of **Omenka and Anyasor (2010)** showed a decrease in total serum cholesterol when pumpkin vegetables were fed to broilers. Moreover, **Hajati et al. (2011)** stated that dietary PSO significantly decreased cholesterol and triglyceride values in blood plasma of broiler chickens. It has also been demonstrated that the chemical composition of feeds supplemented with pumpkin seed oil highly impacts blood levels of triglycerides, total cholesterol, phospholipids, LDL and HDL in poultry **(Martínez et al., 2010 and Martínez, 2012)**. Also, **Aguilar et al. (2011)** found that the inclusion of dietary pumpkin seed meal by 3.3, 6.6 and 10% partly displacing soybean meal and vegetable oil decreased the levels of serum harmful lipids, while the serum levels of good lipids improved in broiler chicken. The explanation of lipid profile improvement due to pumpkin seed supplementation may be related to active substances found in pumpkin which decrease intestine absorption of cholesterol **(Abed and Alkalby 2018)**. In addition, **Abdelnour et al. (2023)** showed that under high ambient temperature groups treated with 2 ml/kg diet of pumpkin seed oil decreased AST and ALT compared to control group. **Nwanna and Oboh (2007)** who mentioned that pumpkin seed oils are able to improve liver function due to the anti-oxidant properties of total phenols and β-carotene content which had been demonstrated to be a strong antioxidant and protective activities against cell injury.

In contrast, **Sharma et al. (2013)** reported that alcoholic extract of pumpkin seed caused significant reduction of AST and ALT to normal levels and related that due to the active component found in the extract which has the protective effect on hepatic cells.

Table (8): Effect of dietary supplementation with pumpkin seed oil on total protein (g/dl), albumin (g/dl), globulin (g/dl) and liver function (GPT, IU/L and GOT, IU/L) on growing Japanese quail

Items	Pumpkin seed oil, %				SE	P-value
	0	0.2	0.4	0.6		
Total Protein	3.98^{b}	4.24^{b}	4.12^{b}	5.15^{a}	0.21	**
Albumin	1.72	1.66	1.86	2.39	0.41	NS
Globulin	2.26	2.58	2.26	2.76	0.34	NS
GPT	15.25^{a}	11.78^{b}	12.42^{b}	12.47^{b}	0.78	*
GOT	95.66	119.37	127.16	110.77	9.92	NS

a-b Means within the columns with different superscript are significant difference (P<0.05).
NS =Not significant ±SE =Standard error * = significant ** =High significant

Table (9): Effect of dietary supplementation with pumpkin seed oil on HDL (mg/dI), triglycerides (mg/dI), Cholesterol (mg/dI) and glucose (mg/dI) on growing Japanese quail

Items	Pumpkin seed oil, %				SE	P-value
	0	0.2	0.4	0.6		
HDL	54.73[a]	46.80[b]	44.95[b]	43.63[b]	2.07	**
Triglycerides	178.34[a]	165.78[a]	183.58[a]	99.50[b]	11.94	**
Cholesterol	198.03	207.43	187.70	204.41	14.36	NS
Glucose	102.35	94.89	98.74	98.41	4.57	NS

a-b Means within the rows with different superscript are significant difference (P<0.05).
NS =Not significant ±SE =Standard error ** =High significant

CONCLUSION

It could be concluded that, adding of PSO supplementation to Japanese quail diets up to levels 0.6g/kg may boost growth performance, some carcass and blood traits of Japanese quail chicks.

REFERENCES

Al-Dabbas, M. M., Al-Ismail, K., Taleb, R. A. and S. Ibrahim, (2010): Acid-base buffering properties of five legumes and selected food in vitro. Am. J. Agric. Biol. Sci., 5: 154-160. DOI: 10.3844/ajabssp.2010.154.160

Al-Zuhairu, H.: Abdel-fattah, A.A. and Elsayedi, M.I. (2000): Pumpkin-seed oil modulates the effect of felodipine and captopril in spontaneously hypertensive rats. Pharmacol. Res, 41(5): 555-563.

Aami-Azghadi. M., A. Golian, H. Kermanshahi and M. Sedghi, (2010): Comparison of dietary supplementation with cumin essential oil and prebiotic fermacto on humoral immune response, blood metabolites and performance of broiler chickens. Global Veterinaria 4: 380-387

Abbas R. J., Sajida A. Al-Shaheen and Tarek I. Majeed (2016): Effect of supplementing different levels of pumpkin seed oil in the diets of spent laying Japanese quail (*Coturnix coturnix japonica*) Association of Genetic and Environmental Resources Conservation (AGERC).

Aguilar Y.M.; Yero, O.M.; Navarro, M.I.V.; Hurtado, C.A.B.; López, J.A.C.; and Mejía, L.B.G., (2011): Effect of squash seed meal (Cucurbita moschata) on broiler performance, sensory meat quality, and blood lipid profile. Rev Bras Cienc Avic 2011;13:219-26. https://doi.org/10.1590/S1516-635X2011000400001

Abed, N.; and Alkalby, J.,(2018): Ameliorative effect of pumpkin seed oil on alterations in thyroid gland functions induced by chlorpyrifos in adult male rats. Basrah Journal of Veterinary Research, 17(3): 307- 318.

Abdelnour, S.A.; Metwally, M.G.E.; Bahgat, L.B.; and Naiel, M.A. E., (2023): Pumpkin seed oil–supplemented diets promoted the growth productivity, antioxidative capacity, and immune response in heat-stressed growing rabbits. Tropcal Animal Health and Production, 55 (1), 1–11. https://doi.org/10.1007/s11250-023- 03460-3

Ciftci, M., T. Güler, B. Dalkiliç. and O.N. Ertas, (2005): The Effect of Anise Oil (Pimpinella anisum L.) On Broiler Performance. Int. J. Poult. Sci., 4: 851-855. DOI: 10.3923/ijps.2005.851.855.

Duncan, D. B., (1955). Multiple ranges and multiple F-test. Biometric, 11: 1042.

Esuoso, K., Lutz, H., Kutubuddin, M. and Bayer, E. (1998). Chemical Composition and Potential of Some Underutilized Tropical Biomass. I: Fluted Pumpkin (Telfairia occidentalis). Food Chem. 61: 487–492.

Fruhwirth, G.O. and Hermetter, A. (2007): Seeds and oil of the styrian oil pumpkin: Components and biological activities. Euro. J. Lipid Sci. & Techn., 109: 1128- 1140.

Glew, R.H.; Glew, R.S.; Chuang, L.-T.; Huang, Y.S.; Millson, M. and Constans, D. (2006): Amino acid, mineral and fatty acid content of pumpkin seeds (Cucurbita spp.) and cyperus esculentus nuts in the

Republic of Niger. Plant Foods for Human Nutrition, 61: 51-56.

Gaafar, HMA, AR Ayat and KFA El-Reidy, (2014): Effect of diet supplemented with Pumpkin (Cucurbita moschata) and black seed (Nigella sativa) oils on performance of rabbits: 1-Growth performance, blood hematology and carcass traits of growing rabbits. Report and Opinion, 6: 52-59.

Hammer kA, CF Carson and TV Riley, (1999): Antimicrobial activity of essential oils and other plant extracts. J Appl Microbiol, 86: 985-990

Hajati H., Hasanabadi A. and Park W.W.(2011): Effects of Dietary Supplementation with Pumpkin oil(*Cucurbita pepo*) onPerformance and Blood Fat of Broiler Chickens during Finisher Period. American Journal of Animal and Veterinary Sciences 6 (1): 40-44

Lampe, J.W. (1999): Health effects of vegetables and fruits: assessing mechanisms of action in human experimental studies. Am. J. Clin. Nutr. 70, 475–90.

Mitra, P.; Ramaswamy, S. H.; Chang, S. K. (2009): Pumpkin (Cucurbita maximus) seed oil extraction using supercritical carbon dioxide and physicochemical properties of the oil. J. Food Eng., 95:208- 213.

Murkovic, M., Hillebrand, A., Winkler, J., Leitner, E., and Pfann-hauser, W.,(1996): Variability of Fatty Acid Content in Pumkin Seeds

(Cucurbita pepo L), Z. Lebensm. Unters. Forsch., 202(4), 275- 278.

Martinez Y, Valdivié M, Martínez O, Estarrón M, Córdova J. (2010): Utilization of pumpkin (Cucurbita moschata) seed in broiler chicken diets. Cuban Journal of Agricultural Science.44(4):387–392

Martínez, Y.,(2012): Chemical characterization of pumpkin seed flour and its use in feeding laying hens and broilers [Doctoral thesis]. Habana, Cuba: Instituto de Ciencias Animal; 2012.

Ng TB, A Parkash and WW Tso, (2002): Purification and characterization of moschins, arginine-glutamate-rich proteins with translation inhibiting activity from brown Pumpkin (Cucurbita moschata) seeds. Protein Expres Purif, 26: 9-13

Nwanna, E.E.; and Oboh, G., (2007): Antioxidant and HepatoprotectiveProperties of Polyphenol Extracts from Telfairia occidentalis (Fluted Pumpkin) Leaves on Acetaminophen Induced Liver Damage. Pakistan Journal of Biological Sciences Volume: 10 | Issue: 16 , Page No.: 2682-2687 DOI: 10.3923/pjbs.2007.2682.2687

Ocak N, Erener G, Burak F, Sungu M, Altop A and Ozmen A (2008): Performance of broilers fed diets supplemented with dry peppermint (Mentha piperita L.) or thyme (Thymus vulgaris L.) leaves as growth promoter source. Czech J. Anim. Sci. 53(4): 169–75.

Omenka, R.O.; and Anyasor, N. G., (2010): Vegetable-based feed formulation on poultry meat quality. African Journal of Food Agriculture Nutrition and Development · February 2010; 2001– 2011.. DOI: 10.4314/ajfand.v10i1.51474.

Procida G, B Snatcher, F Cateni and M Zaccchigna, (2013). Chemical composition and functional characterization of commercial pumpkin seed oil J Sci Food Agri, 93: 1035-1041.

Rabia J. Abbas , Sajida A. Al-Shaheen and Tarek I. Majeed (2016) performance of Japanese quail (Coturnix coturnix japonica) fed different levels of pumpkin (Cucurbita moschata) seeds oil. Inter J Vet Sci, 6(1): 31-35. www.ijvets.com

Ramakrishna RR, K Platel and K Srinivasan, (2003): In vitro influence of spices and spice-active principles on digestive enzymes of rat pancreas and small intestine. Nahrung, 47: 408-412.

Stevenson, D. G.; Eller, F. J.; Wang, L.; Jane, J. L.; Wang, T. and Inglett, G. E. (2007): Oil and tocopherol content and composition of pumpkin seed oil in 12 cultivars. J. Agric. & Food Chem., 55(10): 4005-4013.

Srbinoska, M.; Hrabovski, N. ; Rafajlovska, V.and Sinadinovic-Fiser. S.(2012): Characterization of the seed and seed extracts of Pumpkins Cucurbita maxima D and Cucurbita pepo L from Macedonia Maced. J. Chem. Chem. Eng., 31 (1):65–78 .

Tsaknis, J., Lalas, S. and Lazos E. S. (1997).Characrerization of Crude and Purified Pumpkin Seed Oil. Gras. Aceit. 48: 267– 272.

Tabari MA, K H Ghazvinian, M Irani and R Molaei, (2016): Effect of dietary supplementation of nettle root extract and pumpkin seed oil on production traits and intestinal microflora in broiler chickens. Bulg J Vet Med, 19: 108–116.

Vassiliou AG, GM Neumann, R Condron and GM Polya, (1998): Purification and mass spectrometry assisted sequencing of basic antifungal proteins from seeds of pumpkin (Cucurbita maxima). Plant Sci, 134: 141–162.

Valero, M. and Salmeron, M.C. (2003): Antibacterial Activity of 11 Essential Oils against Bacillus cereus in Tyndallized Carrot Broth. International Journal of Food Microbiology, 85, 73-81.

Xiong XM, (2000): Study on extraction and separation of effective composition of Pumpkin polysaccharide and its glucatonic effect. Chin Tradit Patent Med, 22: 563-565

الملخص العربى

تأثير التغذية علي زيت بذور نبات اليقطين علي الاداء الانتاجي وبعض خصائص الذبيحة وخواص الدم في السمان النامي

شاكر عبدالتواب عبد اللطيف ـ محمود عباس طوسون- أحمد علي سيد عبدالحميد صلاح عبدالحميد
قسم الإنتاج الحيواني والداجنى- كلية الزراعة-جامعة المنيا- مصر

أجريت هذه التجربة لدراسة تأثير زيت بذور اليقطين بمستويات مختلفة(0.2%و0.4%و0.6%) علي بعض الخصائص الإنتاجية و بعض قياسات الدم للسمان الياباني النامي وفي هذه الدراسة تم استخدام 300 طائر عمر يوم تم تقسيمهم عشوائي الي (4 معاملات بحيث تحتوي كل معاملة علي 75 طائر) كما ان كل معاملة احتوت علي 3 مكررات (بكل مكررة 25 طائر) و تم تقسيم المعاملات علي النحو التالي:- المعاملة الاولي(كمجموعة مقارنة) : تم تغذيتها علي عليقه اساسية بدون اي اضافات المعاملة الثانية : تم تغذيتها علي العليقه الأساسية مضاف لها زيت بذور اليقطين بنسبة 0.2 % المعاملة الثالثة : تم تغذيتها علي العليقه الأساسية مضاف لها زيت بذور اليقطين بنسبة 0.4 % المعاملة الرابعة : تم تغذيتها علي العليقه الأساسية مضاف لها زيت بذور اليقطين بنسبة 0.6 % . وقد بدأت المعاملات التجريبية عند عمر يوم الي عمر 6 واتضح من هذه الدراسة لايوجد فروق معنوية بين المعاملات التجريبية فى كل من وزن الجسم والزيادة في وزن الجسم والماكول من الغذاء وكفاءة التحويل الغذائي ومواصفات الذبيحة بين المعاملات المختلفة. واتضح ان الطيور التى تغذت علي عليقة 0.2% من زيت بذور اليقطين كإضافات غذائية احدثت تحسن عددي غير معنوي في كل من وزن الجسم والزيادة في وزن الجسم والكفاءة التحويلية للغذاء والنسبة المئوية لكل من القونصة والاجزاء الماكولة بالمقارنة بعليقة الكنترول بينما سجلت الطيور التي تغذت علي عليقة الكنترول تحسن طفيف في استهلاك الغذاء بالمقارنة بباقي العلائق . كما ان الطيور التي تغذت علي هذه العليقة التى احتوت على 0.6% من زيت بذور اليقطين سجلت اعلى تحسن معنوي فى البروتين الكلى للدم بالمقارنة بباقي العلائق. أما الطيور التى غذيت على العيقة المحتوية على 0.4% من زيت بذور اليقطين أظهر تحسن معنوي فى الحلسريدات الثلاثية مقارنة بباقي المعاملات. وادى اضاقة زيت بذور اليقطين لعلائق السمان الياباني النامي إلى انخفاض فى قيم الدهون عالية الكثافة وانزيم الكبد جلوتاميك بيروفك ترانساميناز.بينما انزيم جلوتاميك اوكسليك ترانساميناز تحسن عدديا بهذة الإضافة.