Zagazig J. Agric. Res., Vol. 45 No. (5) 2018 1701-1709

Food, Dairy and Home Economic Research

http:/www.journals.zu.edu.eg/journalDisplay.aspx?Journalld=1&queryType=Master

UTILIZATION OF OLIVE CAKE BY-PRODUCT FOR IMPROVEMENT OF SHELF LIFE AND QUALITY OF CHICKEN MEAT

Waleed Z. Badawy[1*] and A.A. Saleh[2]

1. Food Technol. Dept., Fac. Agric., Kaferelsheikh Univ., Egypt

2. Poult. Prod. Dept., Fac. Agric., Kaferelsheikh Univ., Egypt

Received: 14/08/2018 ; Accepted: 02/09/2018

ABSTRACT: Olive oil extraction a remaining cake rich in oil that can be used in chicken diets. The objectives of this study are to determine the chemical composition, minerals and fatty acid composition of olive cake (OC). The effect of addition of OC (2 and 4%) to chicken diets on the sensory evaluation, oxidative stability (OS) and bacteriological activity of chicken meat during 15 days storage period at 4°C were also investigated. The results indicated that, the ether extract and crude fiber contents of OC were 12.57 and 50.87%, respectively. In addition, OC contained high percentage of minerals such as K, Mg, Ca and P. In contrast, analysis of fatty acids using GLC revealed that the unsaturated oleic acid (18:1) was predominant (72.1%). Moreover, OS of chicken meat fed on 4% olive cake was significantly higher than that of 2% olive cake during the storage period (15 days). It can be concluded that OC is considered as a good by-product of nutrients and addition of OC in the chicken diet had an influence on reducing of lipid oxidation and delaying colour and odour deterioration in chicken meat during the storage period.

Key words: Olive cake, chicken diet, lipid oxidation, minerals.

INTRODUCTION

The requirements for energy have always increased because of the human activities, industrialization and population increase **(Alhusein *et al*., 1993)**.

The intensive developing and processing of olives produces large quantities of by-product approximately 800 kg olive cake/ton which are used in different ways (**Martín-García *et al*., 2003**).

Olive is a main crop in Mediterranean countries, Argentina and Chile. Olive oil plantations coexist with major farmers sheep production systems in Central Chile. Olive oil extraction is related with the manufacture of abundant quantities of residues (olive cake) that are difficult to arrange and may have a negative environmental effect. OC is an agro-industrial by-product that contains of olive skin, pulp, stone and water (**Alburquerque *et al*., 2004**).

One of the chief challenges in marketing of meat is the retention of quality during storage and sells display by delaying the oxidative deterioration of muscle constituents, such as cholesterol, fatty acids and which concessions the sensory and dietary quality of meat (**Hur *et al*., 2007; Faustman *et al*., 2010)**.

The potential use of OC as a replacer part of the cereal concentrate in diets for small ruminants has been discovered, as this might partially donate both to solving the problem of the removal of OC and to reduce of production prices for livestock feeding. Although, the work of the effect of OC in minor ruminants diets on feed digestibility and animal performances has been relatively commonplace (**Molina-Alcaide and Yáñez Ruiz, 2008**).

*** Corresponding author: Tel. :** +201004114701
E-mail address: walid.metwali@agr.kfs.edu.eg

Olive cake, a mixture of skins, pulp, woody endcarp and seeds, is characterized by a great content in phenolic antioxidants, such as tyrosol, hydroxytyrosol and secoiridoids derivatives (**Servili *et al.*, 2009**).

Several studies testified that OC was added at 2-5% to broiler diets without contrary effects on development performance, carcass features, inner body organs and blood hematology (**Rupic *et al*., 1999; Abo-Omar, 2005; Zangeneh and Torki, 2011**). However, a higher level of OC adversely affects nutrient digestibility (**Abo-Omar, 2000**).

The oxidative stability (OS) of meat is dependent on the balance between muscle pro-oxidant and antioxidant components. Muscle antioxidants include endogenous antioxidant, in addition, molecules of dietary source, like carotenoids, tocopherols (**Descalzo and Sancho, 2008**).

Lipid oxidation is one of the chief factors controlling the acceptability and quality of meat because it is responsible for the development of several changes in meat, besides, the production of potentially toxic compounds (**Zanardi *et al*., 1998**). Furthermore, lipid oxidation is an important matter of concern to retailers because its discolouration effects, plus off-flavour improvement, powerfully affect the meat shelf life (**Allen and Cornforth, 2010**).

The objectives of current study are to estimate the chemical composition, minerals and fatty acid composition of OC. The influence of addition of OC (2 and 4%) to chicken diet on the sensory evaluation, the OS and bacteriological activity of chicken meat during the storage period at 4°C were investigated for improvement of quality and shelf life of chicken meat by decreasing lipid oxidation and delaying colour and odour deterioration in chicken meat during the storage period.

MATERIALS AND METHODS

Raw Materials

The birds (SASSO broiler chicks) and olive cake powder were provided from Al-Sabeel Al-Gadidah Company for poultry production, Tanta, Gharbia District, Egypt.

Methods

Proximate chemical composition of olive cake

Moisture, ether extract, protein, crude fiber, ash and crude fiber contents of olive cake were estimated using the methods outlined in **AOAC (2005)**.

Determination of minerals content of olive cake

Minerals were determined according to **Chapman and Pratt (1978)**. After wet ashing zinc (Zn) and manganese (Mn) were determined using the atomic absorption spectrophotometer (Zeiss FMD3). Calcium (Ca), potassium (K) and sodium (Na) were determined using a flame photometer. Phosphorus (P) was estimated photometrically as the phosphorus molydate complex spectrophotometer at wave length of 650 nm, using a standard curve in relation to the method described in **AOAC (2005).**

Fatty acids composition of olive cake

Lipids from OC were removed with chloroform/methanol (2:1, *V/V*) by **Folch *et al.* (1957)** method and methylated with modifications of **Sukhija and Palmquist (1988)**. The gas chromatography (GC) conditions were similar to those mentioned by **Vargas-Bello-Pérez *et al.* (2013)**.

Preparation of chicken diets

Ninety birds (SASSO broiler chicks) one day age (according to the nutrition guide of Cobb stern) were distributed into three treatment groups and each group has 3 replicates (n=10 birds). The first group was used as control and fed on basil diet (The basil diet was prepared by commercial ingredients as like yellow corn, soybean meal, and corn gluten and the chemical compassion of basil diet and olive cake diets are same and the diets analysis were 21.5% crude protein, 3050 kcal/kg, 1.0% Ca and 0.46% Phosphorus), the second group fed diet contains 2% olive cake and the third group fed diet contains 4% olive cake. The birds fed the diets for 63 days. At 63rd day, ten birds per replicates at the same body weight were slaughtered **(Tougan *et al*., 2013)**. Breast muscle was collected with thigh and wing (with the same proportions) and chopped then frying was done

in sunflower oil at 175-180°C for 0.5:2 min to estimate the sensory evaluation test. The OS and bacteriological activity of fresh chicken meat during the storage period (15 days) at 4 ℃±1 were determined.

Sensory evaluation of chicken meat fed on olive cake

Chicken fed on different rates of OC were sensory tested at zero time for their colour, odour, texture, taste and overall acceptability after frying on a 1 to 15 hedonic scale as defined by **Meilgaard *et al*. (2007)**.

Quality characteristics of the chicken meat (breast, thigh and wing muscle)

Moisture, ether extract, protein and ash contents of the chicken meat were estimated using the methods outlined in **AOAC (2005)**.

Peroxide value (PV)

Peroxide value (PV) of oil extracted from the chicken meat (breast, thigh and wing muscle) was measured using the method outlined by **Leonard *et al*. (1987)**.

Thiobarbituric acid reactive substances (TBARS)

TBARS assay was made according to the method of **Nirmal and Benjakul (2009)** and TBA value was expressed as mg malondialdehyde (MDA)/kg chicken.

Total bacterial counts (TBC)

Total bacterial counts (TBC) of chicken meat (breast, thigh and wing muscle) were estimated by the shelf life at 0 and 15 days in plate count agar by the pour-plate method (**Difco, 1977**).

RESULTS AND DISCUSSION

Proximate Chemical Composition of Olive Cake

The results presented in Table 1 cleared that the chemical composition of OC and found low crude protein (7.0 g/100g) and high ether extract and crude fiber contents (12.57 and 50.87 g/100 g), respectively. In addition, moisture, available carbohydrates and ash contents of OC were 7.12, 21.14 and 8.42 g/100g (on dry weight basis), respectively. These results are in agreement with that mentioned by **Alburquerque *et al*. (2004) and Alvarez-Rodríguez *et al*. (2009)**.

Alvarez-Rodríguez *et al*. (2009) evaluated chemical composition of OC and found a higher ether extract (11.7 g/100 g). **Alburquerque *et al*. (2004)** analyzed olive cake and found that crude protein valued 7.2 g/100 g and ether extract 12.1 g/100 g (on dry weight basis).

Minerals Content of Olive Cake

The results in Table 2 illustrate minerals content of olive cake. The highest value of minerals content was Na (6651.5 ppm) followed by Ca (3010 ppm), K (2985 ppm), Mg (2053 ppm), P (1546.5 ppm) then Fe (85.5 ppm) and Mn (17.15 ppm) were the lowest. Due to the high organic load and substantial amounts of plant nutrients (P,N, K, Fe and Ca) in the composite OC, it can be used as fertilizers, especially it showed a great degree of humification and no phytotoxic effect (**Hachicha *et al*., 2006**).

Fatty Acids Analysis

From the results presented in Table 3, it can be observed that, the main fatty acids of OC were the unsaturated oleic acid (18:1) (72.1%), the linoleic (18:2) (9.5%), the palmatic (C16:0) (7.3%), stearic acid (14:0) (4.4%) and linolenic acid (18:3) (4.1%). Opposition of polyunsaturated oils (linoleic, linolenic and arachidonic) to oxidation depends on factors such as exposure to oxygen, exposure to light, the existence of pigments and heavy metals as well as saturation degree (**Gutierrez *et al.*, 2008**).

Alcaide *et al*. (2003) reported that, the high oleic content of OC was 67.9 g/100g. Although, **Vargas-Bello-Pérez *et al*. (2013)** found a higher proportion of oleic content of olive cake (75.8 g/100g). From all this, it can be inferred the importance of a high accuracy in the characterization of by-products prior to be used in the formulation of commercial feedstuffs.

The sensory evaluation of chicken

The sensory properties of chicken meat fed on diet with added olive cake (0, 2 and 4%) are shown in Table 4. It is clear that the chicken meat with the two and four percentages had relatively near values for colour, taste, odour, texture and overall acceptability compared to control sample. There were no significant

Table 1. Proximate chemical composition (on dry weight basis) of olive cake

Component	Moisture (%)	Crude protein (%)	Ether extract (%)	Ash (%)	Crude fiber (%)	Available carbohydrates (%)
Olive cake	7.12	7.0	12.57	8.42	50.87	21.14

Table 2. Minerals content (ppm) of olive cake (on dry weight basis).

	Minerals (ppm)							
	Na	**K**	**Ca**	**Mg**	**Cu**	**Fe**	**Mn**	**P**
Olive cake	6651.5	2985	3010	2053	4.5	85.5	17.15	1546.4

Table 3. Fatty acids analysis of olive cake

	Fatty acids analysis (%)					
	Palmatic acid	**Stearic acid**	**Oleic acid**	**Linoleic acid**	**Linolenic acid**	**Unknown fatty acids**
Olive cake	7.3	4.4	72.1	9.5	4.1	2.2

Table 4. The sensory evaluation of fried chicken meat fortified by olive cake

Olive cake	Sensory properties				
	Colour	**Taste**	**Texture**	**Odour**	**Overall acceptability**
Control	8.5±0.99 ^{a}	8.2±1.2 ^{a}	8.8±0.83 ^{a}	8.5±1^{a}	8.5±0.96 ^{a}
2%	8.3±0.98 ^{a}	8.1±0.90 ^{a}	8.6±0.79 ^{a}	8.2±1.3 ^{a}	8.3±0.98 ^{a}
4%	8.2±1 ^{ab}	8.1±1.3 ^{a}	8.5±1.1 ^{ab}	8.1±1.1 ^{b}	8.2±0.99 ^{ab}

Averages in the same row with unlike superscripts differed significantly ($P \leq 0.05$).

differences ($P \leq 0.05$) of sensory properties among 0, 2 and 4% samples. The taste is a feeling perceived by the tongue and influenced by the texture. Taste ranged from 8.2 to 8.1, colour and overall acceptability ranged from 8.5 to 8.2 and odour ranged from 8.5 to 8.1.

Quality Characteristics of Chicken Meat (Breast, Thigh and Wing Muscle)

Results given in Table 5 show that the olive cake percentage had affected on all quality characteristics of chicken meat. Increasing the percentage of OC in the chicken diet improved the moisture, fat, ash and protein contents. **Majed *et al.* (2016)** indicated that the biological value of diverse concentrations of OC as improvers of the storability, quality and safety of beef patties was studied. Increasing the percentage of OC in the patties improved the fat and protein contents, moisture, cooking yield and fat retention.

The OS of Chicken Meat

The results presented in Figs. 1 and 2 show that the addition of the olive cake in the chicken diet (2 and 4%) had an effect on lipid oxidation of meat during the storage periods (0, 3, 6, 9, 12 and 15 days). The primary oxidation products measured by estimation of PV and the secondary oxidation products measured by estimation of TBARS. The PV of chicken meat fed on 2% OC was significantly ($P \leq 0.05$) higher than that of 4% OC at the storage period. In addition, PV values of chicken meat fed on 2 and 4% olive cake were significantly ($P \leq 0.05$) lower than that of control at the storage period. PV values of chicken meat fed on 2 and 4% olive cake were 7.6 and 6.9 meq O^2/kg oil at the end of storage period (15 days), with compared to the control (8.5 meq O^2/kg oil). PV values increased by increasing of storage period. Also, TBARS values of chicken meat fed on 4% olive cake were significantly ($P \leq 0.05$) lower than that of 2% olive cake at the storage period. In addition, TBARS values of chicken meat fed on 2% olive cake was significantly lower than that of chicken meat without olive cake (control) at the storage period. TBARS values of chicken meat fed on 0, 2 and 4% olive cake were 3.11, 2.84 and 2.66 mg MDA/kg at the storage period.

Using of 4% olive cake was better than 2% in chicken diets for reducing lipid oxidation because olive cake contain on minerals and phenolic compounds of 2% OC less than 4% OC. However, olive cake contain on high percentage of unsaturated fatty acids (85.7%). Also**,** The performance of poultry and is advisedly affected by the presence of dietary NSP (**Gil-Serrano and Tejero-Mateo, 1988; Saleh *et al*., 2015**).

The OS of unsaturated fatty acids reduces with increasing unsaturation degree due to unsaturated sites are the most susceptible sites for heat induced and radical-based fat oxidation. The products made are like those of autooxidation but the amounts formed vary with temperature even within low temperature ranges of 25–80℃ (**Stewart *et al*., 2003**).

Polyphenol limits the initiation of lipid oxidation by binding metals, such as Fe and Cu, stabilizing them in an inactive form. Meat colour can thus be conserved because of the antioxidants ability to limit oxidation, inhibiting of reactive aldehydes and preventing iron-catalysed lipid oxidation (**Allen and Cornforth, 2010; Dal Bosco *et al.*, 2012**).

Bacteriological Determination

The results presented in Table 6 show that the distribution of total bacteria in chicken meat fed on different rates of olive cake. The total bacteria of chicken fed on 2% olive cake was found 1.2×10^2 and 3.9×10^3 $cfug^{-1}$ at 0 and 15 days, respectively. While, the total bacteria of chicken fed on 4% olive cake was found 1.1×10^2 and 2.5×10^3 $cfug^{-1}$ at 0 and 15 days, respectively. The total bacteria of control were 1.4×10^2 and 6.1×10^4 $cfug^{-1}$ at 0 and 15 days, respectively. These values are close to the counts reported by **Kilonzo-Nthenge *et al.* (2013**), total bacteria numbers were between 3.26 (chicken wings) and 4.75 $cfug^{-1}$ (chicken breast).

Conclusion

This study confirms the importance of olive cake as a vital source of oil especially total monounsaturated fatty acids, crude fiber and minerals. In addition, olive cake as by-product improved the shelf life and dietary value of chicken meat through the storage period. Therefore, adding olive cake in a concentrate-based diet for chicken could be recommended as a natural plan to improve the nutritional quality of chicken without compromising its oxidative stability.

Table 5. Effect of olive cake on quality characteristics of chicken meat

Olive cake	Quality characteristics			
	Moisture (%)	Total ash (%)	Fat (%)	Protein (%)
Control	72.4	0.87	1.80	19.23
2%	72.5	0.89	1.86	20.49
4%	72.5	0.90	1.95	20.63

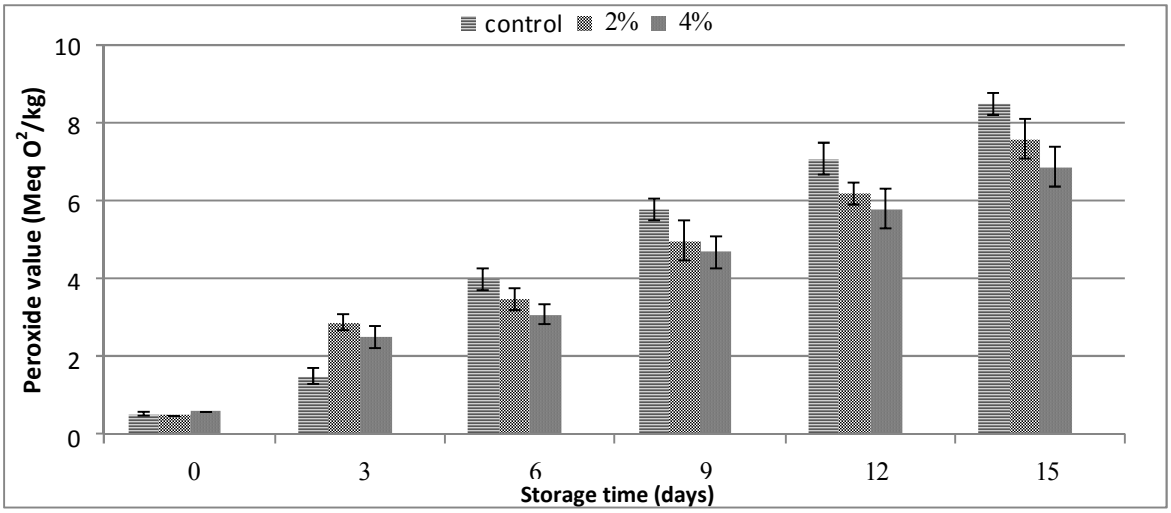

Fig. 1. The effect of storage time on peroxide value (meq O^2/kg oil) of chicken meat fed on diet with added olive cake compared with control at 4±1°C

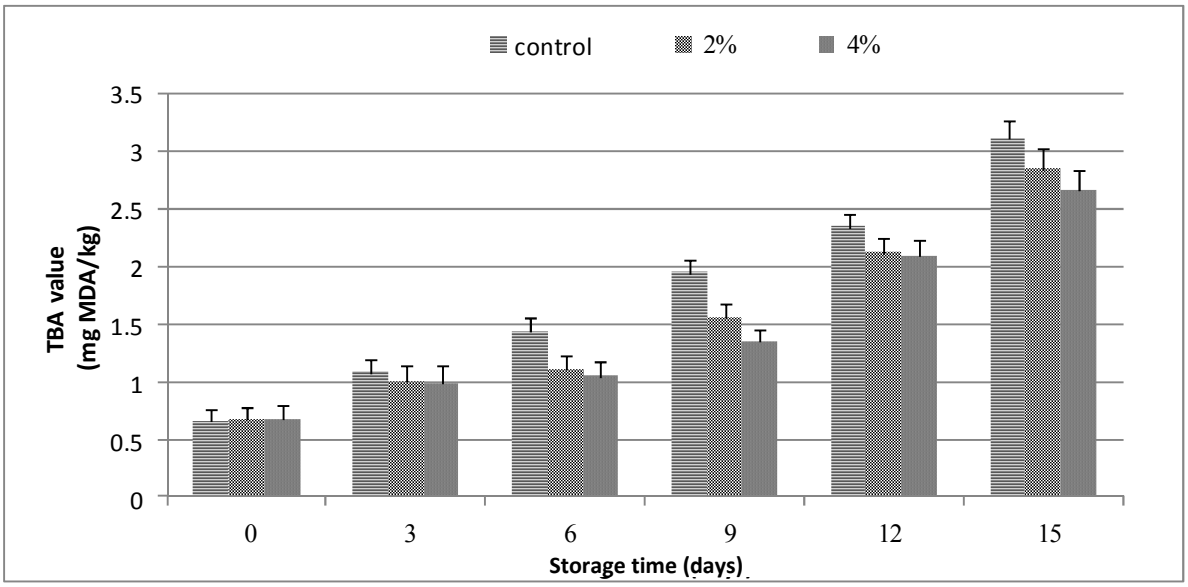

Fig. 2. The effect of storage time on thiobarbituric reactive substances (mg MDA/kg) of chicken meat fed on diet with added olive cake compared with control at 4±1°C

Table 6. Total bacterial counts (cfug^{-1}) of chicken meat fed on olive cake during the storage periods at 4℃±1

Olive cake	Storage period (day)	
	0	15
Control	1.4×10^2	5.1×10^4
2%	1.2×10^2	3.9×10^3
4%	1.1×10^2	2.5×10^3

REFERENCES

Abo-Omar, J. (2000). Effect of different levels of olive pulp on the digestibility of broiler chicks. J. Bethlehem Univ., 12:34–40.

Abo-Omar, J. (2005). Carcass composition and visceral organ mass of broiler chicks fed different levels of olive pulp. J. Islamic Univ. Gaza., 13:75–84.

Alcaide, E.M., D.Y. Ruiz, A. Moumen and I.M. Garcia (2003). Chemical composition and nitrogen availability for goats and sheep of some olive by-products. Small Rumin. Res., 49: 329–336.

Alburquerque, J.A., J. Gonzalez, D. García and J. Cegarra (2004). Agrochemical characterisation of alperujo, a solid by-product of the two-phase centrifugation methods for olive oil extraction. Bioresour. Technol., 91:195–200.

Alhusein, M.A., O. Abu-Leiyah and G.A. Inayatullah (1993). Combined system of renewable energy for grid-connected advanced communities. Renewal Energy, 3 (7): 557-569.

Allen, K. and D. Cornforth (2010). Comparison of spice-derived antioxidants and metal chelators on fresh beef colour stability. Meat Sci., 85 : 613-619.

Alvarez-Rodríguez, J., F. Munoz and M. Joy (2009). Nutritive value of crude and extracted two-stage olive cakes produced in Aragón (Spain). Rev. Electron. Vet., 10 : 1–8.

AOAC (2005). Association of Official Analytical Chemists. Official Methods of Analysis.; 18th Ed. Washington, DC., USA.

Chapman, H.D. and P.F. Pratt (1978). Methods of Analysis for Soil, Plants and Waters. Calif. Univ., Division of Agric. Sci. Priced Publication, 4034 : 50.

Dal Bosco, A., E. Mourvaki, R. Cardinali, M. Servili, B. Sebastiani, S. Ruggeri, S. Mattioli, A. Taticchi, S. Esposto and C. Castellini (2012). Effect of dietary supplementation with olive pomaces on the performance and meat quality of growing rabbits. Meat Sci., 92: 783-788.

Descalzo, A.M. and A.M. Sancho (2008). A review of natural antioxidants and their effects on oxidative status, odour and quality of fresh beef produced in Argentina. Meat Sci., 79:423–436.

Difco, M. (1977). Dehydrated Culture Media and Reagents for Microbiological and Clinical Laboratory Procedures. 9th Ed., Detroit, Michgan, USA.

Faustman, C., Q. Sun, R. Mancini and S.P. Suman (2010). Myoglobin and lipid oxidation interactions: Mechanistic bases and control. Meat Sci., 86: 86–94.

Folch, J., M. Lees and G.H. Sloane-Stanley (1957). A simple method for the isolation and purification of total lipids from animal tissues. J. Biol. Chem., 226:497–509.

Gil-Serrano, A. and P. Tejero-Mateo (1988). A xyloglucan from olive pulp. Carbohydr. Res., 181 : 278–281.

Gutierrez, L., C. Ratti and K. Belkacemi (2008). Effects of drying method on the extraction yields and quality of oils from quebec sea buckthorn (*Hippophae rhamnoides* L.) seeds and pulp. Food Chem., 106: 896–904.

Hachicha, S., M. Chtourou, E. Medhioub and K. Ammar (2006). Compost of poultry manure and olive mill waste as alternative fertilizer. Agron. Sustain. Dev., 26: 135–142.

Hur, S.J., G.B. Park and S.T. Joo (2007). Formation of cholesterol oxidation products (COPs) in animal products. Food Control, 18: 939–947.

Kilonzo-Nthenge, A., E. Rotich and S.N. Nahashon (2013). Evaluation of drug-resistant *Enterobacteriaceae* in retail poultry and beef. Poult. Sci., 92 (4): 1098-1107.

Leonard, W.A., A.E. Woods and M.K. Wells (1987). Food Composition and Analysis. Published by van nostrand Reinhold Company, New York., USA.

Majed, D.H., A. Fahad, A.M.A. Isam, G. Kashif and E.B. Elfadil (2016). Physicochemical, microbiological and sensory evaluation of beef patties incorporated with destined olive cake powder. J. Meat Sci., 122:32-39.

Martín-García, A.I., A. Moumen, D.R. Yanez-Ruiz and E.M. Alcaide (2003). Chemical composition and nutrients availability for goats and sheep of two-stage olive cake and olive leaves. Anim. Feed Sci. Technol., 107: 61–74.

Meilgaard, M.C., G.V. Civileand and B.T. Carr (2007). Sensory Evaluation Techniques. 4th Ed. CRC Press: New York.

Molina-Alcaide, E. and D.R. Yáñez Ruiz (2008). Potential use of olive by-products in ruminant feeding: A review. Animal Feed Sci. Technol., 147: 247–264.

Nirmal, N.P. and S. Benjakul (2009). Effect of ferulic acid on inhibition of polyphenoloxidase and quality changes of Pacific white shrimp (*Litopenaeus vannamei*) during iced storage. J. Food Chem., 116:323–331.

Rupic, V., V. Bozikov, R. Bozac, S. Muzic, N. Varnesic and M. Dikic (1999). Effect of feeding olive by-products on certain blood parameters and serum enzyme activities of fattening rab- bits. Acta Vet Hung, 47:65–75.

Saleh, A.A., H. Kunioki, I. Daichi and O. Akira (2015). The influence of dietary supplementation with *Aspergillus awamori* and feeding canola seeds on the growth performance and meat quality in male broilers chickens. J. Anim. Sci., 86 (3): 305-311.

Servili, M., S. Esposto, R. Fabiani, S. Urbani, A. Taticchi, F. Mariucci, R. Selvaggini and G.F. Montedoro (2009). Phenolic compounds in olive oil: antioxidant, health and organoleptic activities according to their chemical structure. Inflammopharmacol., 17:1-9.

Stewart, O.J., G. Raghavan, V. Orsat and K.D. Golden (2003). The effect of drying on unsaturated fatty acids and trypsin inhibitor activity in soybean. Process Biochem., 39: 483–489.

Sukhija, P.S. and D.L. Palmquist (1988). Rapid method for determination of total fatty acid content and composition of feedstuffs and feces. J. Agric. Food Chem., 36: 1202–1206.

Tougan, P.U., A.K.I. Youssao, M. Dahouda, C.F.A. Salifou; G.S. Ahounou, M. Kopdekon, G.A. Mensah, D.N. Kossou, C. Amenou, C. Kogbeto and A. Thewis (2013). Variability of carcass traits of local poultry populations of *Gallus gallus* spices of Benin by genetic type, breeding mode and slaughter age. Inter. J. Poult. Sci., 12 (8): 473-483.

Vargas-Bello-Pérez, E., R.R. Vera, C. Aguilar, R. Lira, I. Pena, A. Valenzuela and H. Cerda (2013). Effect of dietary inclusion of lampante olive oil in milk and cheese fatty acid profiles of ewes. Grasas Aceites, 54: 295- 303.

Zanardi, E., E. Novelli, N. Nanni, P. Ghiretti, G. Delbono, G. Campanini, G. Dazzi, G. Madarena and R. Chizzolini (1998). Oxidative stability and dietary treatment with vitamin E, oleic acid and copper of fresh and cooked pork chop. Meat Sci., 42:309-320.

Zangeneh, S. and M. Torki (2011). Effects of β - Mannanase supple menting of olive pulp included diet on performance of laying hens, egg quality characteristics, humoral and cellular immune response and blood parameters. Global Vet., 7:391–398.

استخدام مخلف تفل الزيتون فى تحسين العمر التخزينى وجودة لحوم الدجاج

وليد زكريا بدوى[١] - أحمد على صالح[٢]

١- قسم تكنولوجيا الأغذية - كلية الزراعة – جامعة كفر الشيخ – مصر

٢- قسم إنتاج الدواجن – كلية الزراعة – جامعة كفر الشيخ – مصر

تفل الزيتون المتبقى بعد استخلاص زيت الزيتون غنى فى محتواه من الزيت الذى يمكن أن يستخدم فى وجبات الدجاج، أجريت هذه الدراسة بهدف تقدير كل من التركيب الكيماوى، محتوى المعادن وتركيب الأحماض الدهنية فى تفل الزيتون، أيضا دراسة تأثير إضافة نسبة ٢ و٤% تفل الزيتون إلى وجبات الدجاج على الخواص العضوية الحسية، الثبات التأكسدى والنشاط الميكروبى فى لحوم الدجاج المخزن على درجة حرارة ٤ م° لمدة ١٥ يوم تخزين، وأشارت النتائج إلى أن محتوى الزيت والألياف الخام كان ١٢,٥٧ و ٥٠,٨٧% على الترتيب، بالإضافة إلي ذلك، تفل الزيتون يحتوى على نسبة عالية من المعادن (الكالسيوم، البوتاسيوم ، الماغنسيوم والفوسفور)، على الجانب الآخر، تحليل الأحماض الدهنية بواسطة التحليل الكروماتوجرافى يشير إلى أن حامض الأوليك هو الحامض الرئيسى بنسبة ٧٢,١%، قيم البيروكسيد والثيوبارابيوترك للحوم الدجاج المغذى على ٤% تفل زيتون أقل معنويا من ٢% تفل زيتون أثناء فترة التخزين (١٥ يوم)، ويمكن تلخيص أن تفل الزيتون يعتبر مخلف جيد للمغذيات وإضافة تفل الزيتون إلى وجبات الدجاج له تأثير على خفض أكسدة الدهون وتأجيل تدهور لون ورائحة لحوم الدجاج اثناء فترة التخزين.

المحكمـــــون:

١- أ.د. ســـمير يـوســـف الســـناط أستاذ تكنولوجيا الأغذية – كلية الزراعة – جامعة كفر الشيخ.

٢- أ.د. جيهان عبدالله محمد الشوربجي أستاذ الصناعات الغذائية – كلية الزراعة – جامعة الزقازيق.