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CHARACTERIZATION OF SEMI-INTENSIVE EGG PRODUCTION SYSTEM IN RURAL SECTOR OF AL-SHARKIA AND EL-QALIOBIA GOVERNORATES, EGYPT

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ABSTRACT: The study was conducted in Al-Sharkia and El-Qaliobia governorates to describe the semi-intensive egg production system in Egyptian rural. The data was collected during period from June 2016 to December 2017. Samples of 157 individual producers were randomly chosen, through semi-structured interviews with questionnaires, to collect data through monthly visits. The results indicated that the flock size in semi-intensive egg production ranged from 300-750 with average 395.20 laying hens. However, males were the only owned of the flocks in the two governorates. The majority of producers (93.60%) used commercial rations to feed their flocks in Al-Sharkia and 87.50% in El-Qaliobia governorates. In the almost of producers (84.08%) tend to keep chickens on floor in home to minimize the costs. The producers under the semi-intensive egg production system purchasing pullets from local agents at 14.29 weeks of age. Under the semi-intensive egg production system the mean of egg production per layer in Al-Sharkia governorate was 289.54 eggs/year with average egg weight 59.11 gm it were significantly more than that under the same system in El-Qaliobia governorate (286.06 eggs) with average egg weight 59.09 gm. The major diseases presented in the studied areas, were intestinal infections, Salmonella, Leg paralysis, Newcastle disease and respiratory diseases. The major constrains found in the studied areas, were high feeding cost, lack of quality feeds, prevalence of diseases, high production elements cost, lack of access to formal credit, lack of training labours, lack of training producers, lack of veterinary services, high cost of pullets price and unavailability of feed in the nearby area. It was concluded that, more research is required for testing and evaluating semi-intensive egg production system.

Key words: semi-intensive- layer-constrains-production system.

INTRODUCTION

Poultry production is an integral part of Egypt's agricultural sector and plays a vital role in the national economy. This livestock sector has been contributing considerable portion to the economy of the country, and still promising to rally round the economic development of the country. As indicated by Assa (2012) published that, poultry production is the fastest growing component of global animal protein production, with developing and transitional countries assuming a leading role. The poultry sector all over the world is continuously growing due to increasing of human population, increase in purchasing power and urbanization.

In Egypt, poultry products account approximately a third of expenditure on animal protein products and represent around 31% of the total food Bill (AAFC, 2011). The poultry production sector in Egypt can be categorized into two major production systems. These are rural poultry production systems and commercial poultry production systems (El-Wardani et al., 2008). The rural poultry production systems include two sub systems; they are rural family and semi-intensive poultry production system (Gharib et al., 2012). Accordingly to Niranjan et al. (2008) semi-intensive poultry production system is small to medium, market-oriented, commercial poultry production and production system has larger scales and somewhat higher rates of commercialization than the family poultry production (traditional) systems and can follow some practices of the agricultural sectors of industrialized countries. This production system represents a transition stage between traditional and more market-integrated commercial poultry production and combines traditional practices with improved technology and marketing. Therefore, the main objective of this study was to assess the current status of semi-intensive egg production system in Egyptian rural sector, determine the challenges and investigate the needed recommendations for improvement.

MATERIALS AND METHODS

The study was done in two governorates of Egypt (Al-Sharkia and El-Qaliobia). Samples of 157 individual of semi-intensive table egg producers were randomly chosen. This sample was collected from two governorates Al-Sharkia (125 producers) and El-Qaliobia (32 producers) through semi-structured interviews with questionnaires. The data were obtained through monthly visits during the period from June 2016 to December 2017. The random sampling technique was used to choose the semi-intensive table egg producers within the studied areas. The producer data of interest included data about gender, producers age, producer main job, producers education level, labour, flock size, producers adoption rate (years), flock production performance, management practices and challenges faced producers.

Enumeration data of the field survey were analyzed by chi-square procedure (Snedecor and Cochran, 1993). The data collected on flock size were statistically analyzed by the least squares procedure of the general linear model (GLM) of SAS program (SAS, 2004). The separation of means was done using the Duncan's New Multiple Range Test (Duncan, 1955) to compare among the significant means. The fixed model used in the analysis was: $Y_{ij} = \mu + G_i + \varepsilon_{ij}$

Where: Y_{ij} = is the value of the respective variable, μ = is the overall mean of the respective variable, G_i = is the effect due to the i^{th} governorates, i = 1, 2 (1= Al-Sharkia, 2= Al-Qaliobia), ε_{ij} = is a random error associated with the ij^{th} observation and is assumed to be independently and normally distributed.

RESULTS AND DISCUSSIONS

Flock size under semi-intensive egg production system

In the two governorates, the flock size in the semi-intensive egg production system ranged from 300-750 with average 395.20 layers. However, there were no significant differences between the two governorates, in the mean of the flock size. Al-Sharkia presented 79.62% of producers under studied areas with mean of the flock size 373.20 layer. Moreover, El-Qaliobia presented 20.38% of producers with mean of the flock size 417.18 layer. This observation is in agreement with El-Wardani et al. (2008) and Abdel-Megeed et al. (2009). They reported that flock size under semi-intensive poultry production systems were more than 100 birds. In addition, Badubi (2001), in Botswana, mentioned that, the average flock size was 541.20 layers. Otherwise, Phommasack (2014) in Laos reported that, semi-intensive egg production system flock size mean were 2269 ranged from 500-4800 layers. Also, with Yemane et al. (2016) mentioned that small-scale intensive egg production farms in Ethiopia flock size per farm ranged from 56 - 415 layers with a mean of 141.60 layers.

Demographic characteristics of respondents under semi-intensive egg production system

As shown in Table 1, males were the only owned of flocks in the whole system (100%). The respondent's age were divided into three categories. All producers were over 30 years of age. The majority of producers age (63.69%) ranged between 30-40 years, the producers age ranged 41-50 years represented 26.11%. the remained percent 10.20% producers age were more than fifty years. The majority of the producers were 59.87% had free jobs and 25.48% were employee. The remained 14.65% of producers were traders. The majority of the producers were 61.78% had attained high education level, while 38.22% had intermediate education level. Males represented the main source of labour (79.62%) with family help (38.22%). Adoption rate of producers ranged 1-5 times of semi-intensive egg production. The majority of producers (39.49%) adopted twice followed by five times (28.03%) and three times (19.75%). On the other hand, 82.17% of producers work in group membership, while 17.83 working alone without help. The findings are consistent with Phommasack (2014), in Laos, in semi-intensive egg production system. The producers age ranges between 31-40 and 41-50 were presented 31.4 and 20.0%, respectively, of the respondents. Almost half the producers were over 50 years of age. Moreover, two-thirds of the producers were males and one-third was females. Most interviewees (45.70%) have achieved secondary school qualification and only 14.30% had tertiary education. The 28.60% completed primary education, whereas 11.40% had no education. All farms were in operation for less than 10 years. He also mentioned that, the majority of farms (57.10%) have operated the business between 3 to 5 years. Majority of the farms (62.90%) used only the family labour, while 14.30% used only the hired labour. About 30% of the

farms used both family and hired labour. Otherwise, Mbuza et al. (2016), in Rwanda, reported that, in semi-intensive egg production system the majority of the respondents (68%) were males whereas 32% were females. The majority of respondents 46.80% had attended primary school followed by 34.50% who had attended secondary school and only 12.90% had attended university education. Also, NISR (2013) stated that, the majority (72%) of respondent were family members with husbands 42.1% predominating followed by children 28% and spouses 24%, while employees were 28%. Moreover, In Nigeria, Adisa and Akinkunmi (2012) concluded that, the extent of participation of women in commercial poultry activities was low.

Layer strains under semi-intensive egg production system

As presented in Table 2 the main strains used for egg production in studied areas were brown Hy-line (34.39%), brown Dekalb (31.21%), brown Lohmann (25.48%) and brown Hisex (8.92%). All producers (100%) purchased their pullets through local agents. Badubi (2001), in Botswana, reported that, the main strains used for egg production are brown Lohmann (64.3%) and brown Hy-Line (35.70%). All producers (100%) purchased their point-of-lay pullets through local agents. Mbuza et al. (2016), in Rwanda, reported that, the majority of egg farmers (76%) kept Rhode Island Red followed by Isa-brown (54%) and white leghorn (11%). Also, Pettersson et al. (2016) and Singh, (2017) in Australia, reported that, there were two breeds of layers were predominantly used, brown Isa (44%) and brown Hy-line (39%). Approximately 17% respondents used other breeds such as brown Bond, white Bond, black Bond, brown Lohmann and Plymouth Rock.

Management practices under semi-intensive egg production system

Feed and feeding practices

The results, in Table (3), indicated that, in Al-Sharkia the majority of producers (93.60%) used commercial rations to feed their flocks, while 6.40% fed their chicken's homemade ration. Moreover, in El-Qaliobia producers feed their chickens commercial ration presented 87.50%, but 12.50% of producers fed their chicken homemade ration. In general the producers used commercial ration represented 92.36% and the remained 7.64% used homemade ration. Both rations had energy 2800 Kcal/kg and protein 16% from purchasing until 18 weeks of age, while production rations from 18 weeks of age until end of egg production had energy 2950 Kca1/kg and protein 17-18%. But during fattening period producers feed their hens ration contain energy 3000 Kcal/kg and protein 21%. The producers noted that, they used homemade ration at egg production period only not at young ages. Also, almost of the producers fed their chickens in the morning and evening, which seem a common practice in the studied areas (84.71%). However, 15.29% of producers fed their chickens once a day with added the same quantity of ration.

Similar results were reported by Phommasack (2014) in Laos. He found that, almost of producers (77.10%) bought commercial feeds, wile, 22.90% of the farms used local feedstuffs and on-farm mixing ration. On the other hand, our results disagreement with Singh (2017) in Australia, who reported that, the feeding systems under semi-intensive egg production system predominantly, consisted of feed containers (32%) and

automatic feeders (28%), while chain feeders were used by 37% respondent farmers respectively. Also, he reported that, a complete diet was provided for layers on 78% of the farms. The form of the feed varied from coarse ground mash (27%) to fine ground mash (17%), whole grain with mash or pellets (15%), pellets (27%) and others (15%) which included extruded and cooked soy. Additional sources of feed include shell grit (41%), limestone particles (37%), hay (27%), silage (7%) and others including marble chip, barley, straw, pasture, seaweed meal and diatomaceous earth.

Watering practices

Data given in Tables 4 shows indicated that, the major watering practices of the studied areas. Concerning the source of water to chickens was tap water or ground water. The results presented in Table (4) showed that almost all of the householders in Al-Sharkia and El-Qaliobia governorates (92.80 and 84.38%, respectively) depend on tap water as primary source for their chicken. About 97.60 and 70.12% of the producers in Al-Sharkia and El-Qaliobia governorates, respectively provided water for their chicken twice a day, in the morning and evening. Our results are in agreement with Phommasack (2014) in Laos, who reported that all farmers were dependent on ground water for the supply of water. Water was pumped and stored in concrete or plastic tanks. Also, Mbuza et al. (2016) stated that, under semi-intensive system, all producers used ground water for supply their chickens with water and 68% practiced manual watering of chickens. On the other hand, our results disagreement with those reported by Singh, (2017) in Australia, the drinking systems under semi-intensive egg production system consisted of nipple-cup drinkers installed in 54% of the housing facilities, while open water sources such as bell and trough drinkers accounted for the remaining 46%.

Housing practices

The results in Table 5 showed that the type of housing in studied areas. About 95.20% of the producers in Al-Sharkia governorate kept their flocks on floor in their home. Otherwise, in El-Qaliobia governorate most of producers (59.38%) used small chicken's house to keep chickens. In general almost of producers (84.08%) tend to keep chickens on floor in their home to minimize costs. A large proportion of producers in the semi-intensive egg production system (94.90%) used straw, as litter, in their chicken houses. Moreover, there is little proportion in the whole system used sawdust as a litter in their chicken houses. This was related to the available material, in rural areas, and cost. Our results are in agreement with that found by Mbuza et al. (2016). They reported that, Permanent poultry premises were common as 63% of egg farmers had constructed permanent structures like concrete floor, burnt brick walls and iron sheet roofing. According to Singh, (2017) in Australia, reported that, there were two main types of housing under semi-intensive egg production system were identified with 56% of the respondents used modified caravan/trailer (mobile housing), and 44% using fixed sheds. Also, the farms with fixed sheds, 83% used wood shavings and straw as their bedding material, while the rest had a raised floor in home with plastic slats.

Layer production performance under semi-intensive egg production system

Layer age (week)

The production performance traits of the chickens under the studied areas are

presented in Table 6. The results revealed that, the producers under the semi-intensive egg production system purchasing pullets from local agents at 14.29 weeks of age in the two governorates. Layer reached sexual maturity at 18.02 and 18.06 weeks of age in Al-Sharkia and El-Qaliobia governorates, respectively. The differences among the two governorates were non-significant. Otherwise, there were significant differences between two governorates in length of egg production period ($p<0.05$). Length of egg production period in Al-Sharkia and El-Qaliobia governorates were 51.52 and 51.89 weeks, respectively. At end of egg production period the producers fattening their chickens for 4.17 and 4.13 weeks in the two governorates to reach preferred marketing weight. Furthermore, the marketing age in Al-Sharkia and El-Qaliobia governorates were 73.71 and 74.08 weeks, respectively.

Our results are in agreement with these mentioned by Phommasack (2014). He reported that pullets purchasing at 14 weeks age and introduced into cages around 16-18 weeks of age. Furthermore, Badubi (2001) reported that, Pullets are purchasing at 18 weeks old. Also, Pettersson et al. (2016) and Singh, (2017) in Australia, reported that, the majority of the respondent farmers (63%) sourced their pullets from rearing facilities at the age of 12-17 weeks, while 37% of farmers sourced them as daily-olds and reared the layers by themselves. Only 5% farmers hatched pullets on farm. Forty-four percent of the respondent farms reported that the pullets they received had been reared on barns while 44% reported them to have been reared on barns with access to outdoor range. However, 12% of respondents did not know how the pullets had been reared before they arrived on the farm

Feed intake/layer (kg)

Results presented in Table (6) indicated that no significant differences observed in feed intake/layer until sexual maturity between the two governorates. The mean of feed intake/layer in Al-Sharkia and El-Qaliobia governorates from purchasing to sexual maturity were found to be 2.35 and 2.37 kg/layer, respectively. However, there were significant differences ($p<0.05$), detected between the two governorates in feed intake/layer during egg production period (Table 6). Layer feed intake during egg production period were more in El-Qaliobia (43.59 kg) than Al-Sharkia (43.28 kg). The same observed trend was reported in the feed intake/layer in period from purchase until end of egg production. There were significant differences ($p<0.05$), between the two governorates in feed intake. The feed intake in El-Qaliobia was significantly higher (45.97 kg) than that in Al-Sharkia (45.63 kg), with overall mean in system 45.80 kg.

As showed in Table (6), there were no significant differences between the two governorates in feed intake/layer during fattening period, where in Al-Sharkia and El-Qaliobia governorates were 3.50 and 3.46 kg, respectively. The accumulative feed intake/layer from purchase to sell was in significant different between the two governorates ($p<0.05$). In Al-Sharkia, the feed intake/layer was lower than in El-Qaliobia (49.13and 49.43 kg, respectively). There were no significant different between the two governorates in feed conversion ratio during egg production period. Feed conversion ratio (FCR) in Al-Sharkia and El-Qaliobia governorates were 2.52 and 2.57

respectively, while represented 2.55 in whole system (Table 6).

These finding are Similar with those reported by Goitom et al. (2017). They mentioned that, the daily feed intake per bird varied between 72 and 150 gm. Majority of the birds (54.30%) consumed/daily less than 100 gm. Feed conversion ratio was ranged from 1.32 to 2.77 kg feed per a dozen eggs. On average, 1.81 kg feed was required per dozen eggs. Almost half the farms (45.70%) reported feed conversion ratio 1.5 and 2.0 kg feed per dozen eggs. Also, Badubi (2001) stated that, the average daily feed intake was 108 gm. Also, he reported that as average, each layer consumed 35.60 kg during the period from 18 weeks of age to culling, and 1.75 kg of feed was required to produce a dozen eggs, but considerable variation (1.40 to l.95). Moreover, Bejaei et al. (2015), Stadig et al. (2016) and Singh, (2017) reported that, the feed intake were to vary from 80-115 g/layer/daily at 17-19 weeks to 105-120 g/layer/daily at peak of lay. But 78% of the respondents provided feed ad libitum allover periods.

Layer weight (kg)

The differences between the two governorates in layer weight at purchased and layer weight at sexual maturity not statistically significant (Table 6). Layer weight at purchased were 1.12 and 1.10 kg and layer weights at sexual maturity were 1.32 and 1.30 kg in Al-Sharkia and El-Qaliobia governorates, respectively. The same trend was observed in layer weight at end of egg production period (2.03 and 2.03 kg) and layer weight at marketing (2.88 and 2.68 kg) in two governorates Al-Sharkia and El-Qaliobia governorates, respectively. Our results are in agreement with these finding by Phommasack (2014) and Goitom et al. (2017), they reported that, the average body weight at end of egg production cycle in semi-intensive egg production system were ranged between 1.95-2.25 kg. Stadig et al. (2016), Pettersson et al. (2016) and Singh, (2017) reported that, the layers on respondent farms were kept in lay for an average of 83 weeks (ranging between 63-104 weeks). Thirty-six percent of farmers did not record their laying hen's performance. For the farms that did record, the average laying performance was reported to be 75% and varied between farms from as low as 40% to 97%. Recording of layers weights was reported by 52% of farmers. The average body weight for layers that were placed at 17-19 weeks of age varied from 1.30 to 1.60 kg while the average weight of layer at peak lay averaged between 1.80 to 2.10 kg.

Egg production

The overall mean of egg production of the layers raised under the semi-intensive egg production system in Al-Sharkia governorate (289.54 egg) with average egg weight 59.11 gm was significantly higher than that under the same system in El-Qaliobia governorate (286.06 egg) (Table 6). Our results are in agreement with Badubi (2001), Gebregziabher (2007), Phommasack (2014) and Goitom et al. (2017). They mentioned that, the annual egg production ranged widely between 183 and 292 per bird. In 42.80% of the farms, egg production was over 250 eggs per bird per year, while only 8.60% produced less than 200 eggs per year. Otherwise, our results disagreement with these reported in commercial layers management guides, the average of egg production during 52 weeks from commercial layers strains ranged 318-338 eggs/hen. This low in egg production may be due to bad management practices

under semi-intensive egg production system.

Diseases under semi-intensive egg production system

As showed in Table (7), the most prevalent diseases in the studied areas were Diarrhea due to intestinal infections; Salmonella and Newcastle disease, Leg paralysis and respiratory diseases. However, the percent of major infected diseases included intestinal infections 95.54%, Leg paralysis 87.90% and Newcastle disease 84.70% in whole system. Our results similar with Phommasack (2014), reported that, diarrhoea were the main disease condition and it was reported in all farms. The symptom was yellow foamy droppings and it is usually prevalent during the rainy season. During the dry season the birds are affected by respiratory diseases due largely to change of seasons. Almost, half, of the farmers reported that their birds usually cough during this period. Mbuza et al. (2016) reported that, Diarrhea was reported (61%) to be the most prevalent disease condition experienced. This may be as a result of poor hygiene, failure to respect vaccination and deworming protocols. Paralysis and flu which are common manifestations of nutritional disorders and viral infections were also reported by 12% of respondents. Furthermore, Badubi (2001) reported that, diseases or conditions reportedly associated with these deaths included Newcastle disease, prolapse of the uterus and diarrhoea. Diarrhoea may include symptoms of infectious diseases such as salmonellosis, Newcastle Disease, fowl cholera and fowl typhoid.

According to Singh, (2017), the most prevalent transmittable diseases seen in the layers were fowl cholera (17%) followed by coccidiosis (7.30%) and spotty liver (7.30%). Other diseases included infectious bronchitis (IB) and fowl pox. Thirty-two percent of respondents reported their layers to be affected by both internal and external parasites. The remaining 68% of respondents had either never checked or could not see any signs of parasites. Up to 50% of the respondents were neither satisfied with the control options for preventing and treating internal and external parasites, nor the options to treat or control viral and bacterial diseases. Seventy percent of respondents reported no regular veterinarian visits to the farm but contacted one as and when required.

Mortality rate under semi-intensive egg production system

The overall mean of mortality of layers (Table 8) from purchasing to sale was 21.75% (21 and 22.50% in Al-Sharkia and El-Qaliobia governorates, respectively) of which 15.50% occurred among purchasing age until sexual maturity. The rest 6.25% of the mortality occurred during egg production period. The rate of mortality decreased with increasing age. Although the study did not examine the causes of chick mortality, it is likely that diseases were responsible. These results indicated that there is a need to put much effort on the reduction of chick's mortality, which could probably bring a dramatic change in the overall productivity of the system. Our results are in agreement with that reported by Badubi (2001), who stated that there was wide variation mortality between the farms, with values ranging from 1.0 to 12%. Also, Singh, (2017) stated that, less than 5% mortality was reported for pullets by 68% of respondents and for layers at peak of lay

by 62% respondents, while the remaining farmers reported up to 10% mortality.

Major constrains faced producers under semi-intensive egg production system

Results in Table (9), represented the major constrains in the studied areas, were high feeding cost, lack of quality feeds, prevalence of diseases, high production elements cost, lack of access to formal credit, lack of training labours, lack of training producers, lack of veterinary services, high cost of pullets price and unavailability of feed in the nearby area. However, Table 9 summarized the percent of major constrains presented 100, 63.06, 100, 100, 100, 94.90, 89.80, 92.40, 77.71 and 70.70%, respectively in the two governorates. In previous study by Phommasack (2014) reported that, diseases were the major problem identified by all producers as the major constraint to expansion. Low price of eggs, high cost of production. The high costs of egg farming continue to pose a challenge, making it difficult to compete with the chickens company in local markets. It was noted that the price of commercial feed, drugs and vaccine increase every year, while the price of eggs remain low. None of the farmers had received extension support from the government, private companies or non-governorates organizations. Yemane et al. (2016) stated that, egg farmers reported lack of quality feeds, credit and poor market accessibility as the key challenges cited. These may indicated poor service provision from private companies that supply feeds, credits, high price of feed, shortage of land, unavailability of pullets in time, high cost of pullets, feed quality and shortage of water were the major constraints in small-scale intensive urban poultry production.

CONCLUSION AND RECOMMENDATIONS

In Egypt, semi-intensive egg production system represents a transition stage between traditional and more market-integrated commercial poultry production. It has combines traditional practices with improved technology and marketing. The entire poultry value chain of Egypt requires special attention in the studied areas extension and developments to propel it to international standards. Poultry producer need training in all aspects of production and management such as feeding, breeding, housing, health and entrepreneurship. Special attention should be take on developing the national animal feeds industry using the supply chain approach. Alternative sources of poultry feedstuffs should be identified, evaluated and commercialized. Producers should also be encouraged forming production and marketing farmer groups or cooperatives. Therefore, more research is required for testing and evaluating semi-intensive egg production system. Moreover, effective linkages should be developed and strengthen between poultry producers and government to enable easy access to training, extension, veterinary services, information about marketing systems and credit facilities.

Table(1): Demographic characteristics of respondents under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Gender						
Male	125	100	32	100	157	100
Female	0	0	0	0	0	0
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***
Respondents age (year)						
30-40	82	65.60	18	56.25	100	63.69
41-50	31	24.80	10	31.25	41	26.11
More than 50	12	9.60	4	12.50	16	10.20
Pr>ChiSq		<0.0001***		0.0098**		<0.0001***
Job						
Trader	23	18.40	0	0	23	14.65
Employee	27	21.60	13	40.63	40	25.48
Free job	75	60	19	53.38	94	59.87
Pr>ChiSq		<0.0001***		0.0008***		<0.0001***
Education levels						
High	87	69.60	10	31.25	97	61.78
Intermediate	38	30.40	22	68.75	60	38.22
Pr>ChiSq		<0.0001***		0.0339*		0.0031**
Labour						
Male	97	77.60	28	87.50	125	79.62
Family	28	22.40	4	12.50	32	20.38
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***
Adoption rate						
One time	6	4.80	3	9.38	9	5.73
Two times	51	40.80	11	34.48	62	39.49
Three times	14	11.20	17	53.13	31	19.75
Four times	11	8.80	0	0	11	7.01
Five times	43	34.40	1	3.13	44	28.03
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***
Work in group membership						
No	21	16.80	7	21.88	28	17.83
Yes	104	83.20	25	78.13	129	82.17
Pr>ChiSq		<0.0001***		0.0015***		<0.0001***

p-χ^2 within item, with in column (*=p<0.05, **=p<0.01 and ***=p<0.001)

semi-intensive- layer-constrains-production system.

Table(2): Characteristics of layer strains under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Types of breed						
Hisex brown	14	11.20	0	0	14	8.92
Lohmann brown	34	27.20	6	18.75	40	25.48
Hy-line brown	39	31.20	15	46.88	54	34.39
Dekalb brown	38	30.40	11	34.38	49	31.21
Pr>ChiSq		0.0043**		0.0038**		<0.0001***
Source of breeds						
Local agents	125	100	32	100	157	100

p-χ^2 within item, with in column (** =p<0.01 and *** =p<0.001)

Table (3): Feed and feeding practices under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Type of feed						
Commercial ration	117	93.60	28	87.50	145	92.36
Homemade ration	8	6.40	4	12.50	12	7.64
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***
Feeding frequency						
Once a day	18	14.40	6	18.75	24	15.29
Twice a day	107	85.60	26	81.25	133	84.71
Pr>ChiSq		<0.0001***		0.0004***		<0.0001***

p-χ^2 within item, with in column (**=p<0.01 and *** = p<0.001)

Table (4): Watering practices under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Source of drink water						
Tap water	116	92.80	27	84.38	143	91.08
Ground water	9	7.20	5	15.62	14	8.92
Pr>ChiSq		<0.0001***		0.0001***		<0.0001***
Frequency of watering						
Once	3	2.40	7	21.88	10	6.37
Twice	122	97.60	25	70.12	147	93.63
Pr>ChiSq		<0.0001***		0.0015***		<0.0001***
Cleaning of drinkers						
water only	91	72..80	12	37.50	103	65.61
Water with antiseptic	34	27.20	20	62.50	54	34.39
Pr>ChiSq		<0.0001***		0.1573^{Ns}		<0.0001***

p-χ^2 within item, with in column (Ns=not significant, ** = p<0.01 and *** = p<0.001)

Table(5): Housing practices under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Housing type						
Floor in home	119	95.20	13	40.63	132	84.08
Small chickens house	6	4.80	19	59.38	25	15.92
Pr>ChiSq		<0.0001***		0.2888^{Ns}		<0.0001***
Type of litter						
Straw	119	95.20	30	93.75	149	94.90
Sawdust	6	4.80	2	6.25	8	5.10
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***

p-χ^2 within item, with in column (Ns=not significant and ***=p<0.001)

Table (6): Least square mean ± standard errors of layer production performance under semi-intensive egg production system

Items	Al-Sharkia	El-Qaliobia	Overall mean	Sig.
Layers age (week)				
Layer purchase age	14.29±0.01	14.29±0.01	14.29	Ns
Layer sexual maturity age	18.02±0.02	18.06±0.04	18.04	Ns
Egg production period length	51.52±0.02[b]	51.89±0.06[a]	51.71	*
Fattening period length	4.17±0.03	4.13±0.05	4.15	Ns
Marketing age	73.71±0.04[b]	74.08±0.07[a]	73.89	**
Feed intake/layer (kg)				
Feed intake/layer (from purchase until sexual maturity)	2.35±0.01	2.37±0.06	2.36	Ns
Feed intake/layer (during egg production period)	43.28±0.01[b]	43.59±0.05[a]	43.44	*
Feed intake/layer (from purchase until end of egg production period)	45.63±0.08[b]	45.97±0.05[a]	45.80	*
Feed intake/layer (during fattening period)	3.50±0.09	3.46±0.04	3.48	Ns
Accumulative feed intake/layer	49.13±0.05[b]	49.43±0.05[a]	49.28	*
FCR for egg production period (feed consumed (kg)/egg mass (kg))	2.52±0.04	2.57±0.03	2.55	Ns
Layer weight (kg)				
Layer weight at purchasing	1.12±0.04	1.10±0.07	1.11	Ns
Layer weight at sexual maturity	1.32±0.05	1.30±0.07	1.31	Ns
Layer weight at end of egg production period	2.03±0.01	2.03±0.02	2.03	Ns
Layer weight at marketing	2.88±0.01	2.68±0.02	2.78	Ns
Egg production				
Egg number/layer/period (N)	289.54±0.38[a]	286.06±0.44[b]	287.80	**
Egg weight (gm)	59.11±0.24	59.09±0.38	59.10	Ns

[a-b] Values, within a row, with different superscripts differ significantly (Ns=not significant,*=p<0.05 and **=p<0.01)

Table (7): Type of poultry diseases under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
Newcastle						
Infected	108	86.40	25	78.13	133	84.70
Non infected	17	13.60	7	21.87	24	15.28
Pr>ChiSq		<0.0001***		0.0015***		<0.0001***
Mycoplasma						
Infected	86	68.80	15	46.87	101	64.33
Non infected	39	31.20	17	53.13	56	35.67
Pr>ChiSq		<0.0001***		0.7237^{Ns}		0.0003***
Salmonella infection						
Infected	90	72	22	68.75	112	71.33
Non infected	35	28	10	31.25	45	28.67
Pr>ChiSq		<0.0001***		0.0339*		<0.0001***
Coccidiosis						
Infected	102	81.60	27	84.37	129	82.17
Non infected	23	18.40	5	15.63	28	17.83
Pr>ChiSq		<0.0001***		0.0001***		<0.0001***
Infections coryza						
Infected	35	28	14	43.75	49	31.21
Non infected	90	72	18	56.25	108	68.79
Pr>ChiSq		<0.0001***		0.4795^{Ns}		<0.0001***
Leg paralysis						
Infected	110	88	28	87.50	138	87.90
Non infected	15	12	4	12.50	19	12.10
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***
Intestinal infections						
Infected	120	96	30	93.75	150	95.54
Non infected	5	4	2	6.25	7	4.46
Pr>ChiSq		<0.0001***		<0.0001***		<0.0001***

p-χ^2 within item, with in column (Ns=not significant, *=p<0.05 and ***=p<0.001)

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Table (8): Mortality rate under semi-intensive egg production system

Items	Al-Sharkia	El-Qaliobia	Overall mean
Mortality rate (%)			
Mortality until sexual maturity	16	15	15.50
Mortality during egg production period	5	7.5	6.25
Total mortality rate	21	22.5	21.75

No significant difference between two governorates for mortality rate (χ^2 =4.86, P=0.1823)

Table (9): Major constrains faced producers under semi-intensive egg production system

Items	Al-Sharkia		El-Qaliobia		Overall mean	
	N	(%)	N	(%)	N	(%)
High cost of pullets price	95	76	27	84.38	122	77.71
Lack of quality feeds	82	65.60	17	53.13	99	63.06
High feeding cost	125	100	32	100	157	100
Unavailability of feed in the nearby area	87	69.60	24	75	111	70.70
High production elements cost	125	100	32	100	157	100
Prevalence of diseases	125	100	32	100	157	100
Lack of training producers	118	94.40	23	71.87	141	89.80
Lack of training labours	122	97.60	27	84.37	149	94.90
Lack of marketing information	35	28	12	37.50	47	29.94
Lack of access to formal credit	125	100	32	100	157	100
Lack of veterinary services	118	94.40	27	84.37	145	92.40

Differences between two governorates for constrains are significant (χ^2 =15.46, P=0.0086)

REFERENCES

AAFC, Agriculture and Agri-Food Canada .2011 Market Information Africa and the Middle East. http://ats.agr.ca./stats/egypt

Abdel-Megeed, A.H.; Abdel-Aziz, Y.A.; Omar. A.S.; Sammour, H.B. and Zatter, O.M. .2009 Chicken performance, feeding, major disease incidence, and hygiene in two low-input poultry production systems in the rural sector of Fayoum governorate. J. Agric. Sci. Mansoura Univ., 34(2):1005-1018.

Adisa, B.O. and Akinkunmi, J.A. 2012. Assessing participation of women in poultry production as a sustainable livelihood choice in Oyo state, Nigeria. IJPAES ISSN 2231-4490.

Assa, M.M. 2012. Poultry production and rural poverty among small-scale farmers in Zumba District of Malawi. Livestock Research for Rural Development. 24:(177).

Badubi, S.S. 2001. Small-Scale poultry production systems in Botswana and evaluation of a natural zeolite in broiler diets. (M.Sc.), Massey University.

Bejaei, M.; Wiseman, K.; Cheng, K.M. 2015. Developing logistic regression models using purchase attributes and demographics to predict the probability of purchases of regular and specialty eggs. British Poultry Science. 56(4):425-435.

Duncan, D.B. 1955. The Multiple Ranges and multiple F-Tests. Biometrics,11:1-42.

El-Wardani, M.A.; Abdel-Aziz, A.Y.; Omar, S. Amal; Abdelmaged, A.H. and Zatter, O.M. 2008. Characterization of poultry production systems in the rural sector of Fayoum. Egyptian J. Anim. Prod., 45:85.96.

Gebregziabher, M. 2007. Characterization of the smallholder poultry production and marketing system of Dale, Wonsho and Loka Abaya Weredas of SNNPRS. M.Sc. thesis. Hawassa University, Ethiopia.

Gharib, H.B.; Abdel-Aziz, Y.A.; El-Menawey, M.A. and Hamouda, R.E. 2012. Characterization of Family Poultry Production System in the Rural Sector of Al-Sharkia Governorate, Egypt. Egyptian J. Anim. Prod., 49(2):195-205.

Goitom G.; Bezabih E. and Berhanu G. 2017. Mapping poultry value chain functions in Adwa Wereda, central zone of Tigray, Ethiopia. Industrial Engineering Letters, 7(8).

Mbuza, F.; Habimana, R.; Simbankabo, T. and Majyambere, D. 2016. Characterization of egg production in Rwanda. International Journal of Agricultural Sciences ISSN 2167-0447 Vol. 6 (10), pp. 1148-1156.

Niranjan, M.; Sharma, R.P.; Rajkumar, U. and Battacharya,T.K. 2008. Egg quality traits in chicken varieties developed for backyard poultry farming in India. Livestock Res. Rural Dev 20(12).

NISR, 2013. Statistical Yearbook, Rwanda. National Institute of Statistics of Rwanda.

Pettersson, I.C.; Weeks, C.A.; Wilson, L.R.M. and Nicol, C.J. 2016. Consumer perceptions of free-range laying hen welfare. British Food Journal. 118(8):1999-2013.

Phommasack, O. 2014. A survey of commercial small-scale poultry production systems and nutrient

characterization of local feed ingredients in Laos. (M.Sc.), Massey University.

SAS, 2004. SAS User's Guide: Statistics. Version 9.1. SAS Inst. Inc., Cary, NC., USA.

Singh, M.; Ruhnke I.; Koning C.; Drake, K.; Skerman, A.G.; Hinch, G.N. and C. Glatz, P.C. 2017. Demographics and practices of semi-intensive free-range farming systems in Australia with an outdoor stocking density of≤1500 layers/hectare. PLoS ONE 12(10): 1-19.

Snedecor, G. W., and Cochran, W. G. 1993. Statistical methods ISBN: 0-8138-1561-4.

Stadig, L.M.; Ampe, B.A.; Gansbeke, S.V.; Bogaert, T.V.D.; D'Haenens, E. and Heerkens, J.L.T. 2016. Survey of egg farmers regarding the ban on conventional cages in the EU and their opinion of alternative layer housing systems in Flanders, Belgium. Poultry Science. 95(3):715-725.

Yemane, N.; Tamir, B. and Mengistu, A. 2016. Constraints, opportunities and socio-economic factors affecting flock size holding in small scale intensive urban poultry production in Addis Ababa, Ethiopia. Agriculture and Biology Journal of North America, pp. 2151–7525.

المستخلص العربي

توصيف نظام إنتاج البيض شبه المكثف في القطاع الريفي بمحافظتي الشرقية والدقهلية- مصر

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أجريت الدراسة في محافظتي الشرقية والقليوبية وذلك لتوصيف نظام إنتاج البيض شبه المكثف في الريف المصري. تم جمع البيانات خلال الفترة الممتدة من يونية 2016 إلي ديسمبر 2017 حيث تم إختيار عدد 157 مربي بصورة عشوائيه عن طريق المقابلات الشخصيه الشهرية مع إستمارة إستبيان منتظمة. أوضحت النتائج أن حجم قطيع الدجاج تحت هذا النظام يتراوح بين 300-750 بمتوسط عام 395.20طائر. وجد أن الرجال فقط هي الفئة الوحيدة القائمة بإدارة القطعان. أغلبية المنتجين (93.60%) في محافظة الشرقية يستخدمون العلائق التجارية لتغذية قطعانهم و 87.50% في محافظة القليوبية. يميل معظم المنتجين (84.08%) إلي إستخدام طابق بالمنزل لتربية قطعانهم وذلك لتقليل النفقات. جميع المنتجين تحت نظام إنتاج البيض شبه المكثف يقومون بشراء بداري إنتاج البيض من الوكلاء المحليين على عمر 14.29 أسبوع. متوسط إنتاج البيض للدجاج المربي تحت نظام إنتاج البيض شبة المكثف في محافظة الشرقية (289.54 بيضة) بمتوسط وزن للبيضة 59.11 جم أعلي معنويا من محافظة القليوبية بمتوسط 286.06 بيضة بمتوسط وزن للبيضة 59.09 جم. أوضحت الدراسة أهم الأمراض التي تصيب قطعان الدجاج البياض شبة المكثف في منطقة الدراسة وعلي حسب أهميتها بالترتيب هي الإلتهابات المعوية، السالمونيلا، مشاكل الأرجل، ومرض النيوكاسل، وأمراض الجهاز التنفسي. أهم المعوقات التي تواجة المربيين في المناطق تحت الدراسة حسب ترتيب أهميتها هي أرتفاع تكاليف التغذية، عدم جودة الأعلاف المتاحة، وانتشار الأمراض، عناصر الإنتاج عالية التكلفة، وعدم إمكانية الوصول ومعرفة التسهيلات الائتمانية الرسمية، الإفتقار للعمالة المدربة، وكذلك بعض المنتجين غير مدربين، ونقص الخدمات البيطرية والتكلفة العالية لسعر البداري وعدم توافر الأعلاف في المنطقة المجاورة. ولذلك، مطلوب إجراء مزيد من الأبحاث لاختبار وتقييم نظم إنتاج البيض شبه المكثف.

الكلمات الدالة: شبه المكثف، بياض، معوقات، نظام الإنتاج.