

## The level of knowledge of poultry fields workers in Najaf Province, Iraq with preventive practices against bird flu disease

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### ABSTRACT

This research aimed to determine the level of knowledge of poultry field workers in Al-Kufa City, Najaf Province with preventive practices against bird flu disease and its relationship to some of their personal and objective factors. A questionnaire form was adopted to collect data including two parts. The first one was related to personal and objective information of workers in poultry fields. The second one was included a cognitive level test for them, including 40 test items distributed into four areas of knowledge about bird flu as follows: bird flu disease, transmission ways of disease to human, preventive practices against the disease and types of disinfectants used in poultry fields. The study was included 722 workers in all poultry fields of Al-Kufa City and a random sample of them (15%) was applied. Results showed that the level of knowledge of poultry field workers was weak to medium and varied among knowledge areas of bird flu disease. There was a positive correlation between the cognitive level and each of academic achievement and the type of breeding, while, there was negative correlation with age and field specialization variables. Other factors such as years of work, workers number, the level of contact with preventive and indicative information sources, the distance between the field and the house and the type of birds had no significant correlation. The study was recommended the necessity of establishing indicative programs for workers in poultry fields about preventive practices and disinfectant types used against bird flu disease.

**Keywords:** Bird flu disease, Poultry workers, Cognitive level, Agricultural extension.

### INTRODUCTION

The progress of any rural community does not take place by exerted randomly activities and efforts, but can be exerted by indicative programs that work accordingly to reach the required goals and objectives. Among the most prominent problems that face rural societies particularly in developing countries, the high rates of illiteracy and low levels of education, which require indicative activities and agricultural extension workers to use simple and easy-to-understand language to convey indicative information (Abdel-Ghany 2020). Bird flu is spread in many countries worldwide, and Iraq is taking extensive preparations to prevent the disease from entering the country, especially after it included some neighbouring countries such as Turkey, Iran and other countries that located on the migration line of birds passing through Jordan and Syria (Enshasy 2010). Al-Kufa City is distinguished by a number of poultry fields due to the suitable climate for successful breeding of poultry, as the number of these fields reached over 120 fields in 2020 including 4 fields for the production of table eggs with a production capacity of 59000 eggs per day and 110 fields for the production of poultry meat with a production capacity of over 600 thousand chickens per time and one field for the productivity of hatching eggs with a production capacity of over 12 thousand per day and 5 hatcheries with a production capacity of over 20 million eggs annually (Danmaigoro *et al.* 2019; Alkheraz, A 2020, Chaturvedi, S 2021, Mohammadzadeh, H 2021, Karimi, A 2021, Ismail, S 2021). Those fields are managed by 722 workers, at a rate of 6 workers per field under the supervision of 4 veterinarians

and an agricultural engineer (Animal Statistical Report 2020). Despite there was no infection or death among birds in those field by bird flu, all birds have been slaughtered directly by workers without consulting specialist or follow the preventive practices before starting to slaughter birds and stacked it in freezers while, many people stopped to eat poultry meat at that time (Anon 2020), indicating that workers in those fields lack the simplest indicative information on how to deal with epidemic diseases in general and bird flu in particular (Indicative Monthly Report, 2020). The exposure of poultry to disease leads to a heavy loss for the breeder, especially when raising large number, and it should not be forgotten that the adoption of treatment in poultry diseases is not considered correct choice always, since the poultry heals from the infection after treatment may not return to its natural state, in terms of production. Therefore, adopting the principle of prevention is better than treatment is the cornerstone of fighting poultry diseases (Al-Saeid *et al.* 2020). When following the stages of the application process of the instructional instructions by workers, it can be noticed that they go through the following stages: feeling the topic, interest, evaluation and application, as it can be noticed that the first and second steps in which the role of mass communication media such as radio, television and publications excels over personal communication, while, for the third and fourth stages, the role of personal communication is superior (Saleh 2000). The lack of proper actions in marketing and controlling transportation of alive birds and its products between the provinces of the country as well as the arrival of migratory birds to the areas of marshlands in the south raises the possibility of bird flu disease infection (Mohammed & Al-Baha 2009). Based on the principle of analysing and studying the level of knowledge which is the starting point for planning successful extension programs to develop the cognitive level for workers in poultry fields, the current study aimed to determine the level of knowledge of poultry fields workers in Al-Kufa City, Najaf Province, Iraq with preventive practices against bird flu disease and its relationship to some of their personal and objective factors.

## MATERIALS AND METHODS

The study was conducted in Al-Kufa poultry fields in Najaf Province, Iraq as it included 722 workers in all those fields and a random sample of them (15%) was applied following directorate of agriculture records. A questionnaire form was adopted to collect data and it included two parts: the first one is related to personal and objective information of workers in poultry fields. The second one was included a cognitive level test for them, including 40 test items distributed into four areas of knowledge about bird flu as follows: 1- knowledge of bird flu disease (11 test items), 2- knowledge about the transmission ways of disease to human (13 test items), 3- knowledge of preventive practices against the disease (11 test items), 4- knowledge about types of disinfectants used in poultry fields (5 test items). The estimated weights for each test items was given by veterinary experts to be used in the measuring the cognitive level of poultry field workers with preventive practices against bird flu disease. A pre-test was conducted for a sample of workers (30 workers) in Al-Hydaria which is located outside the study borders in order to determine the coefficient of stability and validity of the scales used in the search tool using the half-segmentation method and the reliability factor for the cognitive level test was 0.9 and the validity factor 0.92, while the reliability coefficient for the measure of the contact level with preventive indicative information sources was 0.49 and the validity factor 0.74, indicating consistency according to the test reliability level guide (Al-Kawaga 2017).

The difficulty of test items ranged between 0.32 and 0.76 with an average of 0.54, indicates the good test items and can be adopted in the measurement (Al-Kawaga 2017). The test discrimination strength equation was used following Ebell scale as a benchmark to compare the discrimination strength of test items (Otwan & Abo Shaban 2019). Results of the test items analysis showed that the strength of item discrimination ranges from 0.28 to 0.44 with an average of 0.36, indicating good test items. 10 double-answer questions (true and false) were established and repeated to some test items in separate places to ensure the validity of responses of tested workers where 1 mark given to the true answer and 0 to false one in March 2020 (results of test items showed the validity of 100 responses of tested workers out of 108, and then the actual number of tested workers becomes 100).

## Statistical methods

Frequencies, percentages and mean were used to describe the numerical values of search variables, while the standard deviation and standard score were used to convert the numerical scores into standard degrees to avoid measurement errors (Mansy 2019). The simple statistical factor was also used to find the relationship between each independent factor and the knowledge level of workers in the poultry fields (Al-Taeb 2019), and t-test to

find out the significance of correlation between the cognitive level, then each independent factor compared to *t* value in the table (Adass 2013), the difficulty of test items and the response validity scale (Salama & Abo Magly 2018). Thereafter, the test discrimination strength equation for 10 test items was used with weighted arithmetic mean equation to compare between averages of cognitive levels concerning to bird flu and the strength of correlation guide (Salama & Magly 2018).

## RESULTS AND DISCUSSION

### Determining the level of knowledge of poultry field's workers in Al-Kufa City, with preventive practices against bird flu disease

Results showed that the highest score test achieved by tested workers was 98 marks and lowest mark was 14 with an average of 39.3 marks at 100 marks scale, and all numerical degrees were converted to standard degrees to divide them into three stages of cognitive level (Table 1). This table showed that about 16% of workers were included in the high stage of cognitive level with an average of 74.3 marks, while about 57% in the medium stage with an average of 39.5 marks and also about 27% in the low stage with an average of 18 marks. These results refer to that about  $27+57 = 84\%$  of workers were included between medium and low level of cognitive level.

**Table 1.** Numbers, rate (%) and levels of knowledge of workers in all knowledge fields.

Cognitive level categories	Standard score	Number	Rate (%)	The average of cognitive level
High	More than +1	16	16	74.3
Medium	Between +1 and -1	57	57	39.5
Low	Less than -1	27	27	18
Total	Mean 39.3	100	100	Standard deviation 20.1

### Determining the level of knowledge of poultry-field workers in Al-Kufa City in all cognitive fields about bird flu disease

#### Knowledge about bird flu disease

Test scores reached between 1 to 20 marks, and results showed that about 14% of workers were included in the high stage of cognitive level with an average of 16.1 marks, while about 69% in the medium stage with an average of 9.6 marks and about 17% in the low stage with an average of 4.7 marks (Table 2).

**Table 2.** Numbers, rate (%) and levels of knowledge for workers in all knowledge fields about bird flu.

Cognitive level categories	Standard score	Number	Rate (%)	The average of cognitive level
High	More than +1	14	14	16.1
Medium	Between +1 and -1	69	69	9.6
Low	Less than -1	16	16	4.7
Total	Mean 9.7	100	100	Standard deviation 3.7

#### Knowledge about transmission ways of bird flu disease

Test scores recorded between 2 to 33 marks, and results showed that about 15% of workers were included in the high stage of cognitive level with an average of 23.9 marks, while about 67% in the medium stage with an average of 11.9 marks and about 18% in the low stage with an average of 6.4 marks (Table 3).

**Table 3.** Numbers, rate (%) and levels of knowledge of workers in knowledge about transmission ways of bird flu.

Cognitive level categories	Standard score	Number	Rate (%)	The average of cognitive level
High	More than +1	15	15	23.9
Medium	Between +1 and -1	67	67	11.9
Low	Less than -1	18	18	6.4
Total	Mean 12.41	100	100	Standard deviation 6.6

#### Knowledge about preventive practices against bird flu disease

Results showed that test scores recorded between 3 to 35 marks, and about 18% of workers included in the high stage of cognitive level with an average of 25.3 marks, while about 67% in the medium stage with an average of 9.8 marks and about 15% in the low stage with an average of 3.6 marks (Table 4).

#### Knowledge about types and concentrations of disinfectants used in poultry fields

Test scores were recorded about 2 to 12 marks, and about 15% of workers were included in the high stage of cognitive level with an average of 10.4 marks, while about 74% in the medium stage with an average of 4.7 marks and about 11% in the low stage with an average of 1.8 marks (Table 5).

**Table 4.** Numbers, rate (%) and levels of knowledge of workers in knowledge about preventive practices against bird flu.

Cognitive level categories	Standard score	Number	Rate (%)	The average of cognitive level
High	More than +1	18	18	25.3
Medium	Between +1 and -1	67	67	9.8
Low	Less than -1	15	15	3.6
Total	Mean 11.7	100	100	Standard deviation 7.2

**Table 5.** Numbers, rate (%) and levels of knowledge of workers in knowledge about types and concentrations of disinfectants used in the poultry fields.

Cognitive level categories	Standard score	Number	Rate (%)	The average of cognitive level
High	More than +1	15	15	10.4
Medium	Between +1 and -1	74	74	4.7
Low	Less than -1	11	11	1.8
Total	Mean 5.26	100	100	Standard deviation 2.7

A comparison was carried out between averages of cognitive levels using weighted arithmetic mean, exhibiting that the highest cognitive level among workers was the knowledge about bird flu and its transmission ways to human, as both levels followed by knowledge about types of disinfectants used in poultry fields at the second order and knowledge about preventive practices against bird flu disease at the third (Table 6).

**Table 6.** Arrangement of cognitive level of workers in knowledge fields according to weighted arithmetic mean.

Knowledge field	Weighted arithmetic mean	Rank
1 knowledge about bird flu	2.1	First
2 Knowledge about transmission ways of bird flu to human	2.1	First
3 knowledge about types of disinfectants used in poultry fields against bird flu	2.04	Second
4 knowledge about preventive practices against bird flu disease	0.03	Third

### Determining the relationship of cognitive level of poultry field's workers with each personal and objective factor

#### A- Personal factors

1- Age: results showed that the lowest age among workers was 21 and the highest age was 70 with a mean of 50 years., The cognitive level, rate (%) and correlation factor were determined according to age (Table 7), indicating negative relationship between age and the cognitive level. Then, to confirm the significance of relationship, t-test was used and showed the significance of the relationship at 0.01.

**Table 7.** Correlation, numbers and percentages depending on the age of workers in poultry fields.

Age	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
29 years or less	5	5	61	Calculated r value -0.61	Calculated t value 4.61
30-39	5	5	48.6		
40-49	32	32	45.5	Table r value	Table t value
50-59	40	40	34.55	0.245	2.625
60 years or more	18	18	34.3	Significance level	
Total	100	100		**0.01	

2- Educational achievement: results showed that about 4% of workers were illiterate (average = 31 marks), 17% literate (average = 31.8 marks), 23% primary educated (average = 27.2 marks), 21% were medium educated (average = 36.7 marks), 8% high school-educated (average = 39.8 marks), 14% bachelor educated (average = 51.8 marks) and 13% postgraduates (average = 63.4 marks; Table 8), indicating positive correlation between the cognitive level and educational achievement. In order to verify the strength of relationship, t-test was used, exhibiting the significance of the relationship at 0.01.

3- The number of work years in poultry fields: results showed that about 4% worked for a short time (few years; average = 59 marks), 27% medium work years (average = 49.3 marks) and 69% long work years (average = 34.6 marks; Table 9), indicating no correlation between the cognitive level and the number of work years in poultry fields, and to confirm the significance of relationship, t-test was used and showed no significant relationship at 0.01.

4- The level of contact with preventive and indicative information sources: numerical degrees were converted to standard degrees to get three stages of contact level with preventive and indicative information sources. Results showed that about 8% of workers were categorized in the high-contact level (average = 42.5 marks), 78% medium-

contact level (average = 39.3 marks) and 14% weak-contact level (average = 34.1 marks; Table 10), revealing no correlation relationship between the cognitive level and the level of contact with preventive and indicative information sources. In order to verify the significance of relationship, t-test was used displaying no significant relationship at 0.01.

**Table 8.** Correlation relationship between cognitive level and educational achievement of workers in poultry fields.

Educational achievement	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
illiterate	4	4	31	Calculated value 0.482	Calculated value
literate	17	17	31.8		5.46
primary educated	23	23	27.2	Table value	Table value
medium educated	21	21	36.7	0.254	2.625
high school	8	8	39.8	Significance level	
Bachelor	14	14	51.8	**0.01	
postgraduate	13	13	63.4		
Total	100	100			

**Table 9.** Correlation relationship between cognitive level and the number of work years in poultry fields.

Work years	Number	%	The average of cognitive level	Correlation factor (Person)	t-test
5 years or less	4	4	59	Calculated value -5.5	Calculated value -0.861
6 to 16 years	27	27	49.3		
16 years or more	69	69	34.6	(Table value 0.05)*	(Table value 0.05)*
				0.0195	1.982
Total	100	100		Not significant	Not significant

**Table 10.** Correlation relationship between cognitive level and the level of contact with preventive and indicative information sources.

Contact level	Standard degree	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
high contact level	More than +1	8	8	42.5	Calculated value 0.111	Calculated value 1.132
medium contact level	Between +1 and -1	78	78	39.3	(Table value 0.05)*	(Table value 0.05)*
					0.195	1.982
weak contact level	Less than -1	14	14	34.1	Not significant	Not significant
Total		100	100			

## B- Objective factors

1- The number of workers in poultry fields: results showed that about 49% of workers were (in fields with low number of workers) with cognitive level of 34.5 marks, 25% (in fields with medium number) with 42.04 marks and 26% (in fields with high number of workers) with 37.76 marks (Table 11), indicating no correlation relationship between the cognitive level and the number of workers in poultry fields, and in order to verify the significance of relationship, t-test was used, exhibiting no significant relationship at 0.01.

**Table 11.** Correlation relationship between cognitive level and the number of workers in poultry fields.

Workers categories	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
Fields with low number of workers 5 or less	49	49	34.5	Calculated value 0.045	Calculated value 0.044
Fields with medium number of workers 6 to 10	25	25	42.04	(Table value 0.05)*	(Table value 0.05)*
				0.195	1.982
Fields with high number of workers 11 or more	26	26	37.76	Not significant	Not significant
Total	100	100			

2- The distance between the field and the house: results showed that about 17% of workers were (close to fields) with an average of 39.36 marks, 55% (medium distance from fields) with 29.36 marks and 28% (far from fields) with 24.8 marks (Table 12), revealing no correlation relationship between the cognitive level and the distance between the field and the house, and in order to verify the significance of relationship, t-test was used, displaying no significant relationship.

**Table 12.** Correlation relationship between cognitive level and the distance between the field and the house.

The distance between the field and the house categories	Number	Rate (%)	The average of cognitive level	Correlation factor (Person)	t-test
Close to fields	17	17	39.4	Calculated value	Calculated value
Medium distance from fields	55	55	29.36	0.028	0.292
Far from fields	28	28	24.6	(Table value 0.05)*	(Table value 0.05)*
				0.195	1.982
Total	100	100		Not significant	Not significant

3- Specialization of field: results showed that about 35% of workers were included in egg production fields with an average of cognitive level of 42.5 marks, 36% in meat production fields with 33.14 marks and 29% in egg and meat production fields) with 43 marks (Table 13), indicating negative correlation relationship between the cognitive level and the type of field. In order to verify the significance of relationship, t-test was used, revealing significant relationship at 0.01\*\*.

**Table 13.** Correlation relationship between cognitive level and the specialization of poultry field.

Specialization of field categories	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
Egg production fields	35	35	42.5	Calculated -0.75	Calculated 11.79
Meat production fields	36	36	33.14	Table 0.261	Table 2.625
Egg and meat production fields	29	29	43	Significance level	Significant level
Total	100	100		0.01**	0.01**

4- Breeding type: results showed that about 61% of workers were included in (field breeding) with an average of 36.85 marks and 39% were included in (field and house breeding) with an average of 43.13 marks (Table 14), indicating positive correlation relationship between the cognitive level and the type of breeding. In order to verify the significance of relationship, t-test was used and showed significant relationship at 0.05\*\*.

**Table 14.** Correlation relationship between cognitive level and breeding type.

Breeding type categories	Number	Rate (%)	The average of cognitive level	Correlation factor (Pearson)	t-test
Field breeding	61	61	36.58	Calculated 0.184	Calculated 1.91
Field and house breeding	39	39	43.13	Table 0.195	Table 1.982
Total	100	100		Significant level	Significant level
				0.05*	0.05*

5- Bird type: results showed that about 84% of workers were dealing with poultry only, with an average of 38.2 marks, while 16% with poultry and pet birds and 45.3 marks (Table 15), revealing no correlation relationship between the cognitive level and bird type. In order to verify the significance of relationship; t-test was used, exhibiting no significant relationship.

**Table 15.** Correlation relationship between cognitive level of workers in poultry fields and bird type.

Birds type categories	Number	Rate (%)	The average of cognitive level	Correlation factor (Person)	t-test
Only poultry	84	84	38.2	Calculated 0.116	Calculated 1.17
Poultry and pet birds	16	16	45.3	Table 0.195	Table 1.982
Total	100	100		Not significant	Not significant

It is important to establish special indicative program about preventive practices against the disease and types of disinfectants used in poultry fields. In addition, particular research needs to be conducted to enhance knowledge

level of workers about bird flu disease in poultry fields and it is necessary to distribute specialized brochures on this topic between workers of poultry fields.

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