



FISH BREEDERS' AWARENESS OF SOME GOOD HEALTH PRACTICES IN THE FIELD OF HEALTH CARE IN DAQUQ DISTRICT / KIRKUK GOVERNORATE / IRAQ

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Article history:	Abstract:
<p>Received: 14th June 2022 Accepted: 14th July 2022 Published: 28th August 2022</p>	<p>The research aimed to identify the level of awareness of fish breeders of some health practices in the field of fish health care in the district of Daquq / Kirkuk governorate / Iraq, and to determine the correlation between the level of awareness of fish breeders and each of the following independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources), as well as identifying the most important obstacles facing fish breeders in the field of fish health care. Daquq district in Kirkuk governorate was chosen as a research area, The research sample included (52) respondents representing (20%) of the research community who were randomly selected and the questionnaire was used as a tool for data collection and in the personal interview method. The results showed that more than half of the respondents fall within the category of average level of awareness, and that there is a significant correlation between the respondents' level of cognition and each of the variables: (educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources), while the most important obstacles facing fish breeders, which occupied the first three ranks are: (Failure to provide preventive vaccines for viral and bacterial diseases, The prevalence of diseases and the ineffectiveness of treatments and the weakness of the extension and veterinary role in the field of fish farming in general), and in light of the results, the researcher recommended a number of recommendations, including: Working to raise the level of awareness of fish breeders by holding training courses, seminars and workshops for them by the extension training center in Kirkuk governorate in cooperation with the Agricultural Extension Department in the Directorate of Agriculture, as well as cooperation with the Veterinary Department in Kirkuk.</p>

Keywords: Agricultural Extension, Awareness, Fish breeders, Kirkuk

INTRODUCTION

The fish wealth in Iraq represents an important source of food security, especially since Iraq possesses a wide water area and that the Iraqi internal waters have physical and chemical specifications suitable for the growth and reproduction of fish, and live in the Iraqi internal waters types of economically important fish such as (*Cyprinus carpio*, *barbus sharpeyi*, *Barbus barbulus*, and *Barbus luteus*) as well as the ordinary carp (Al-Zoubaidy & Abbas, 2018), The field of fish farming is one of the activities of the food-producing sectors in the world during the last two decades. Therefore, fish farming is one of the most important solutions to facing the problem of food shortages that threaten the world, especially developing countries with limited resources, as it provides a protein source with high nutritional value and relatively cheap compared to protein sources. In addition, eating fish helps reduce the incidence of many diseases such as cardiovascular and thyroid diseases, and the use of fish powder as poultry feed. In addition, Iraqis prefer to eat fish as a general social food (Naji, A.A. 2016).

Fisheries is one of the important branches of livestock on which the economy of many countries in the world depends, and the importance of fish comes from being of high nutritional value because it contains a high percentage of animal protein beneficial to human health, and because it is an important and vital alternative to red meat and poultry. Countries in the world to follow a food policy that would raise the level of protein nutrition from animal sources, as one of the important measures of the level of progress and well-being of peoples, and the plans of these countries aim to achieve self-sufficiency in food commodities as much as possible, and increase production rates to

meet the growing gap between production and consumption, and with increasing population growth rates, the development of fish production is one of the main axes to address the food gap resulting from the increase in the population at rates that exceed the rates of increase in food production (Ali & Farhan, 2015).

Fisheries has attracted the attention of many countries around the world to achieve sustainable development, and this valuable wealth has great technical and economic aspects, especially after the increase in the population and the change in the consumption pattern as a result of openness to the outside world and the development of environmental awareness (Al-nashmi, 2005).

Fisheries is an important resource in the Arab agricultural resource base, as some Arab countries, including Iraq, depend on it in food production and bridging the food gap, especially in the field of animal proteins, as well as providing job opportunities and realizing foreign exchange earnings as a result of exporting the surplus of fish production (Elasrag, 2013). Therefore, the current focus of governments is to encourage intensive fish farming to provide food and increase the income of fish farmers (Ntsama, et al, 2018). The availability and diversity of water sources means that there are great possibilities for fish production and the provision of quantities of food to the population, and the most important ways to exploit these sources in fish farming is to establish modern fish farms that depend on modern scientific methods in operating and investing them, and if production requirements, correct management and health care are available. It would have given large quantities of fish, which would contribute effectively to achieving food security for the population (Barakat, no date). There is no doubt that promoting the development of fish farming through increasing production comes by the diffusion and application of the new technical methods in fish production, as well as following the proper health care methods and work to solve the problems of fish farming that prevent the application of these methods (Abdullah, 2017).

Recently, this sector has attracted great interest and is rapidly growing through the development of aquaculture as a result of the increased demand for fish as a source of animal protein, and culture methods have become more intensive to produce higher yields to meet this increase in demand, but sometimes heavy losses in production occur for many reasons, including the lack of awareness by fish farmers of the rational practices in the field of fish health care, and to overcome these losses, it is necessary to work to reduce or remove all health obstacles on the basis of scientifically proven and recommended methods as well as the locally applied methods, and since "prevention is better than cure", it is recommended to focus on preventing disease rather than treating it (Ayat, 2006). Despite the state's interest in developing fish farms and making more efforts to increase fish production, the rate of increase in the production of these farms is not in line with the large population increase, which led to a widening gap between production and consumption, so work must be done to reduce this gap, and that by intensifying extension activities to maximize the benefit of these farms, and to provide fish breeders with knowledge and information to increase their knowledge of the optimal recommendations for fish farming and then increase their production, and help them to follow the modern scientific foundations in this field, which has an impact on narrowing the food gap associated with animal protein (Al-Jazzar, et al, 2017).

The General Commission of Fisheries Development and the General Commission of Agricultural Extension are the authorities responsible for extension and developing the knowledge of fish breeders in Iraq. This is indicated by the extension activities prepared in the field of developing the knowledge of fish breeders (Al-badry, et al, 2008). And since agricultural extension is one of the basic components of sustainable agricultural development programs that are responsible for providing an integrated system for the flow of knowledge, information and ideas used in various fields from their research sources to the counselors (Swanson, 1990), and since fish extension is one of the important areas in which agricultural extension is currently concerned with its importance in the agricultural economy as well as the national economy, and given the importance of determining the level of awareness of fish farmers about some good practices in the field of fish health care, This field is of paramount importance in fish farms because infection with the disease leads to deaths in fish, an additional cost of treatment, and a decrease in the growth rate of fish, and this in turn leads to an increase in production expenses and a decrease in the quantity and quality of fish produced at harvest, which results in material losses for farmers. and about the role that agricultural extension can play in increasing the awareness of fish farmers it is necessary to conduct this research in order to answer the following questions:

1. What are the distinctive personal characteristics of fish breeders in Daquq district / Kirkuk governorate?
2. What is the level of awareness of fish breeders of some good practices in the field of fish health care?
3. What are the variables affecting the level of awareness of respondents in the field of health care?
4. What are the most important obstacles facing fish breeders in the field of fish health care?

OBJECTIVES OF THE RESEARCH

This research mainly aimed to achieve the following objectives:

1. Identifying the level of awareness of the fish breeders about some good practices in field of the fish health care.
2. Identify onto some of the personal characteristics of fish breeders which represent the following independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses in the field of fish farming, and communication with information sources).
3. Determining the correlation between the level of awareness of fish breeders in the field of health care and each of the independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses in the field of fish farming, and communication with information sources).

4. Identify onto most important obstacles facing the fish farmers in field of the fish health care.

Procedural Definitions

Awareness: It means the extent of knowledge and implementation of fish breeders for good health practices in field of fish health care.

Good practices: It is a set of good practices and actions that fish breeders should carry out in order to provide and meet the health needs of fish throughout the breeding period to avoid infection among fish.

Fish health care: includes taking precautions and following the necessary preventive measures to prevent fish from getting sick starting from the stage of preparing the ponds for culture, through all stages of growth until harvesting

RESEARCH HYPOTHESES

According to the third objective, the research attempted to test the following null statistical hypothesis: (There is no a significant correlation between the level of awareness of fish breeders in the field of health care and each of the independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and level of communication with information sources)).

Material and Research Methods:

1. Research Methodology

The current research comes within the framework of exploratory and diagnostic research that falls within the descriptive approach in conducting the research in order to reveal the reality, as this approach is appropriate in arriving at detailed data and facts about the knowledge of fish breeders at a specific time (Al-Asadi, 51: 2008). These data and facts are categorized, processed and analyzed thoroughly to derive their implications and reach accurate and adequate results and generalizations about the phenomenon for the subject of the research (Al-Rashidi, 16:2002).

2. Research Zone

The research was conducted in the district of Daquq, which is administratively affiliated to the governorate of Kirkuk, which is located 40 km to the south of the city of Kirkuk, which is the center of the governorate and on the road leading to the capital, Baghdad. Daquq district is one of the agricultural areas that are famous for the fertility of its lands and the diversity of cultivation of agricultural crops in it as well as the interest of its residents. In the past, it has become famous for raising fish, as breeding ponds are widely spread in all villages and their affiliated countryside, which led to a noticeable increase in production and the export of the product to other governorates of Iraq. So that Daquq fish became famous at the level of Iraq.

3. Research population and its sample

The research population included all the fish breeders in Daquq district, whose number is (258) breeders distributed over separate areas within the administrative borders of the district. A simple random sample was selected from them by 20% , thus the size of the research sample was (52) breeders .

4. Data collection, measurement and analysis

A special questionnaire was designed to collect data according to the objectives of the research. It consisted of three parts, the first part included a number of questions to identify some personal characteristics of the respondents which represent the following independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources) which were measured as follows:

1. Age: measured by the number of years of age of the respondent at the time of data collection.

2. Educational level: It was measured through six educational levels (read and write, primary, intermediate, secondary, diploma, and bachelor) to which numerical values were given (1, 2, 3, 4, 5, 6) respectively.

3. Years of experience in fish farming: It was measured by the number of years the respondents spent in fish farming.

4. Number of ponds owned: It was measured by the number of ponds owned by the respondent until the time of data collection.

5. Participation in training courses in the field of fish farming: It was measured through the two alternatives (yes) and (no) and they were given numerical values (2, 1) respectively.

6. The level of communication with information sources: It was measured through a quadrilateral scale consisting of the alternatives (always, sometimes, rarely, and not) and numerical values were given to them (3, 2, 1, 0) respectively.

While the second part included a triple scale to measure the level of awareness of fish breeders of some rational practices in the field of fish health care, consisting of (22) items, in front of each of them three alternatives (agree, agree to some extent, disagree) to which numerical values were given (3, 2, 1) respectively for positive items and (1, 2, 3) respectively for negative items, Thus, the theoretical range of the scale ranged from (22 - 66) degrees, and the degree that the respondent obtains from his answer to the items of the scale indicates the extent of his awareness. As for the third part of the form, it included an open question about the most important obstacles facing fish farmers in the field of fish health care. After completing the design of the form in its initial form, it was presented to specialists in the field of agricultural extension and specialists in the field of fish in order to achieve the apparent validity and content validity of the scale, and a pre-test of the form was conducted on a sample of (10) respondents who were later excluded from the research sample, To identify the appropriateness and clarity of the paragraphs of the form, as well as to find the stability coefficient of the scale used to measure the extent of the respondents' awareness by the

split-half method and the use of the Pearson correlation coefficient to find the relationship between the odd and even items of the scale, and the value of the reliability coefficient was (0.78). And then the validity coefficient was found with the root of the reliability coefficient, as its value reached (0.88), which indicates that the scale is characterized by high stability and validity and is valid for data collection from the respondents. The data were collected during the months of January and February 2022, and were unloaded, classified and analyzed using a number of statistical methods, including (frequencies, percentage, arithmetic mean, Pearson's simple correlation coefficient, Spearman's ordinal correlation coefficient) using the statistical program (SPSS) (Statistics Package for Social Science).

RESULTS AND DISCUSSION

The following is a description of the results of this research and their discussion, arranged according to the objectives of the research

First: Identifying The Level Of Awareness Of The Fish Breeders About Some Good practices in field of the fish health care.

The results of the research showed, as shown in Table (1) that the actual numerical values, according to the scale of fish breeders’ awareness of some good practices in the field of fish health care, ranged between (35) degrees as a minimum, to (55) degrees as a maximum, with an arithmetic mean of (46.08) degrees, and a standard deviation of (4.89), and the respondents were classified according to the law of range into three categories, where the first category included respondents with a low level of perception (35 - 41) degrees, and their number reached (10) respondents representing 19.23% of the total number of respondents, while the second category included respondents with a medium level of perception (42-48) degrees, and their number reached (28) respondents representing (53.85%) of the total number of respondents , while the third category included respondents with a high level of perception (49-55) degrees, where their number reached (14) respondents representing (26.92%) of the total number of respondents, and the above results indicate that more than half of the respondents fall within the category medium level of perception. This may be due to the low level of knowledge of the respondents in the field of fish health care, which affected their level of awareness, as knowledge is the basis of human behavior, and it affects the individual’s response to other things and people, and the knowledge acquired by the individual grows and develops into cognitive systems that affect the behavior of the individual and his actions, and that the lack of knowledge of the respondents may be due to the weak role of agricultural extension, as well as the lack of training courses in the field of fish health care.

Table (1) Distribution of the respondents according to their level of awareness

Categories	Frequency	Percentage	Mean	the total mean	Standard deviation
Low (35 – 41)	10	19.23	38.6	46.08	4.89
Medium (42 – 48)	28	53.85	44.8		
High (49 – 55)	14	26.92	51.5		
Total	52	100.00			

Second: Identify Onto Some Of The Distinctive Characteristics Of Fish Breeders.

The results of the research showed as in Table No. (2) the following:

With regard to the variable (age), it was divided into three categories, and the largest number of respondents was within the middle-aged category, where their number reached (21) respondents, at a rate of (40.38%) of the total respondents. As for the variable (educational level), it was divided into six categories, and the largest number of respondents was within the category of diploma holders, where their number reached (16) respondents, at a rate of (30.8%), and the secondary school certificate holders came in second place, with a number of (11) respondents and a rate of (21.2%), while the category of holders of an intermediate certificate came in third place, with a number of (10) respondents, at a rate of (19.2%) of the totality of the respondents. As for the variable (years of experience in fish farming), it was divided into three categories, and the largest number of respondents was within the category with medium experience, as their number reached (22) respondents, at a rate of (42.31%) of the total number of respondents. As for the variable (the number of owned ponds), it was divided into three categories, and the largest number of respondents was within the first category with a few ponds (2-4) ponds, where their number reached (24) respondents, at a rate of (46.15%) of the total number of respondents. While the variable (participation in training courses) was divided into two categories (participation and non-participation), the results showed that the vast majority of respondents did not participate in training courses in the field of fish health care, as their number reached (39) respondents, at a rate of (75%) of the The total number of respondents, as for the variable (the level of communication with information sources) was divided into three categories and the largest number of respondents was within the category of the high level of communication with information sources, where their number reached (21) respondents, at a rate of (40.38%) of the total respondents.

Table (2) Distribution of the respondents according to their characteristics

Characteristics	Categories	Frequency	Percentage	mean
Age (year)	Young (30 – 38)	19	36.54	33.8
	Medium (39 – 47)	21	40.38	43.14
	Old (48 – 56)	12	23.08	51.3
	Total	52	100.00	
Educational level	Reads & writes	3	5.8	
	Primary	6	11.5	
	Intermediate	10	19.2	
	Secondary	11	21.2	
	Diploma	16	30.8	
	Bachelor's	6	11.5	
	Total	52	100.00	
Years of experience in fish farming	Little (4 – 7)	16	30.77	5.5
	Medium (8 – 11)	22	42.31	9.3
	Great (12 – 15)	14	26.92	14.4
	Total	52	100.00	
Number of owned ponds	Few (2 – 4)	24	46.15	3.4
	Medium (5 – 7)	16	30.77	5.9
	Large (8 – 10)	12	23.08	7.3
	Total	52	100.00	
Participation in training courses	Participate	13	25	
	did not participate	39	75	
	Total	52	100.00	
Communication with information sources	Low (8 – 13)	14	26.93	10.2
	Medium (14 – 19)	17	32.69	16.4
	High (20 – 25)	21	40.38	20.8
	Total	52	100.00	

Third: Determining the correlation between the level of awareness of fish breeders in the field of health care and each of the independent variables: (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources).

In order to determine the correlation between the respondents' level of awareness and each of the independent variables (age, educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and contact with information sources), the Pearson correlation coefficient and the Spearman correlation coefficient were used. The results showed, as shown in Table (3), that there is a significant correlation between the respondents' level of awareness and each of the variables (educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources), and thus we reject the null hypothesis, and we accept the alternative hypothesis which states (there is a statistically significant correlation between the level of awareness of fish farmers in the field of health care and each of the independent variables (educational level, number of years of experience in fish farming, number of owned ponds, participation in training courses, and communication with information sources), while the results showed that there is no significant correlation between the respondents' level of awareness and age, and accordingly we accept the null hypothesis which states (there is no significant correlation between the level of awareness of fish farmers in the field of health care and age).

Table (3) Correlational relationships between the respondents' level of awareness and the independent variables.

variables	Pearson correlation	Spearman correlation	Level of significance
Age (year)	- 0.102		NS
Educational level	---	0.333	*
Years of experience in fish farming	0.661	---	**
Number of owned ponds	0.523	---	**
Participation in training courses	---	0.479	**
Communication with information sources	0.780	---	**

** Correlation is significant at the 0.01

* Correlation is significant at the 0.05

NS Correlation is not significant

Fourth: Identify onto most important obstacles facing the fish breeders in field of the fish health care.

The results of the research showed that there are many obstacles that facing fish breeders in the area of research in the field of fish health care, These obstacles were arranged according to the frequency mentioned by the respondents themselves, as shown in Table (4). The table shows that the obstacles that occupied the first three ranks among the obstacles are: (Failure to provide preventive vaccines for viral and bacterial diseases) in the first place with (71%) of the total number of respondents, It was followed in the second place (the prevalence of diseases and the ineffectiveness of treatments) with (61%) of the total number of respondents, and it came in third place (the weakness of the extension and veterinary role in the field of fish farming in general) with a percentage of (58%) of the total number of respondents. While the following obstacles occupied the last three ranks (the lack of scientific recommendations by the competent authorities regarding health care for fish by (25%), power outages for long periods and high fuel prices to provide electric power by (21%), and the use of open and unrefrigerated cars to transport fish by (15%) of the total number of respondents), the last three places in a row.

There is no doubt that knowing the obstacles facing fish breeders in the field of health care and trying to overcome them by the concerned authorities is one of the important things that help fish breeders to overcome them and thus improve health care for fish, which leads to improving and increasing production.

Table (4) The most important obstacles facing the fish breeders in field of the fish health care.

obstacles	Frequency	%	rank
Failure to provide preventive vaccines for viral and bacterial diseases	37	71	1
The prevalence of diseases and the ineffectiveness of treatments	32	61	2
The weakness of the extension and veterinary role in the field of fish farming in general	30	58	3
Failure to perform laboratory tests to diagnose viral diseases	26	50	4
Lack of training courses for fish breeders in the field of monitoring the health status of fish	25	48	5
High prices of feed materials for fish farming	21	40	6
The difficulty of obtaining feed that contains the ingredients necessary for fish growth	17	33	7
Lack of veterinarians specialized in the field of fish	16	31	8
Lack of scientific recommendations by the competent authorities regarding health care for fish	13	25	9
power outages for long periods and high fuel prices to provide electric power	11	21	10
Use of open and unrefrigerated cars to transport fish	8	15	11

RECOMMENDATIONS

In light of the results of the research, the researcher recommends some recommendations to represent the practical benefit of the research, which are as follows:

1. Working to raise the level of awareness of fish breeders by holding training courses, seminars and workshops for them by the extension training center in Kirkuk governorate in cooperation with the Agricultural Extension Department in the Directorate of Agriculture, as well as cooperation with the Veterinary Department in Kirkuk.
2. Activating and revitalizing the role of agricultural extension and veterinary in performing their tasks in this aspect by visiting breeders to guidance them and provide assistance and advice to them in this field.
3. Providing the necessary preventive vaccinations for breeders by the veterinary department in the research area.
4. Cooperation between the Extension Training Center, the Agricultural Extension Department, the Veterinary Department in the governorate, and the Colleges of Agriculture and Veterinary Medicine at the University of Kirkuk in order to develop and formulate a set of scientific recommendations related to fish health care and circulate them to breeders in the research area for the purpose of relying on and applying them.
5. Working to overcome the obstacles which facing fish breeders in the research zone in the field of fish health care by the concerned authorities and to take into consideration and give priority to the obstacles that occupied advanced ranks in their ranking

REFERENCES

1. Abdullah, A.M.(2017), **Obstacles of Fish Farming Among Owners of Fish Farms in Kafr El- Sheikh Governorate**, The Journal of Sustainable Agricultural Sciences, 43(2), pp 43-56.
2. Al-Assadi, S.J. (2008), **Ethics of scientific research in the humanities, educational and social sciences**, Second Edition, Warith Cultural Foundation, Department of Studies and Research, Iraq.
3. Al-badry, A.A. et al (2008), **lore extension reality of fishmen by environmental pollution, its causes, and problems in fish farms**, The Iraqi Journal of Agricultural Sciences-39(4) pp 89-97..
4. Ali, M.H & M.A. Farhan (2015), **Measuring the Economic Efficiency of Fish Holding in Cages in Iraq**, The Iraqi Journal of Agricultural Sciences-46(1) pp 46-54.
5. Al-Jazzar, M. A. et al. (2017), **Knowledge of Fish Breeds by The Technical Recommendations of Fish Culture at Hamoul Center, Kafr El - Sheikh Governorate**, Journal of Sustainable Agricultural Sciences, 43(3), pp 73-89.
6. Al-Nashmi, M.H (2005), **Economics of Fish Production for the Traditional Fishery Sector in Saudi Arabia**, Master Thesis, King Saud University /College of Food & Agriculture Sciences.
7. Al-Rashidi, B.S.(2002), **educational research methods**, First Edition, Modern Book House, College of Education, Tikrit University.
8. Al-Zoubaidy, K.Y. & A.A. Al-Timimi (2018), **Estimate of Optimum Production of Fish Farms in the Season 2012 in Salah-Aldeen Governorate**, Diyala Agricultural Sciences Journal, (2) 10, pp 222-230.
9. Ayat, M.S.(2006), **Fish production, care and diseases**, Comprehensive Agricultural Library. https://www.agro-lib.site/2020/05/blog-post_27.html
10. Barakat, K. (without date), **The Basics of Establishing Modern Fish Farms**, Ministry of Agriculture and Agrarian Reform, Agricultural Extension Directorate, Media Department, Syrian Arab Republic.
11. Elasrag, H.A (2013), **"Fish farming and Arab food security"** Arab Food Security Situation Report 2012. <https://elasrag.wordpress.com/2013/09/28>
12. Naji, A.A. (2016), **Participation of Agricultural Extension Services in the Field of Fish-Farms Practices in Middle Provinces of Iraq**, The Iraqi Journal of Agricultural Sciences-47:(Special Issue) pp 156-160.
13. Ntsama, I. S., et al, (2018), **Characteristics of Fish Farming Practices and Agrochemicals Usage Therein in Four Regions of Cameroon**, Egyptian Journal of Aquatic Research, 44, pp 145 - 153.
14. Swanson, B.E. (1990), **Agriculture extension** , a reference manual , second -edition , F.A.O of the United Nations Rom.