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Study of the growth of common carp Cyprinus carpio in muddy ponds using a local diet

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Conclusion

The current study examined the culture of the common carp Cyprinus carpio in three lakes supplied with water from Shatt Al-Badaa, a section of the Euphrates River, located in the Al-Rifai district, the village of Al-Nazim, between latitude 46.0703 in the south and a length of 31.5540N. 2021 and up to (23/2/2022) Three standardized treatments were used in the culture density of 1000 fish/m3 divided into three lakes equally and with an average weight of 20 ± g. A standardized local diet was used to feed the fish. The temperature during the experiment ranged between 14-28 (C) values. pH (7-8.5), dissolved oxygen concentration (6.7-9.0) mg/L. Salinity ranged between 0.2-0.3) g/liter. The results of the statistical analysis of the protein efficiency ratio outperformed the fish of the third treatment (62.210). The results of the statistical analysis indicated that the percentage of protein in the muscles of fish after the experiment was higher, reaching 5.76%, while the lowest percentage in the muscles of fish before the experiment was 3.61. The percentage of protein decreased at the beginning of the experiment. We notice an increase in the percentage of protein deposited in the fish body at the end of the experiment. The results of the experiment when analyzed on the basis of dry weight showed a difference in the percentage of fat in the chemical analysis of fish muscles before the experiment, 0.0048%, while the percentage of fat in the chemical analysis of fish muscles after the experiment was 39%. This may be due to the large size of the fish during the experiment period, in addition to its adoption in Feeding on the natural food found in the ponds. The current study showed an increase in the percentage of ash in fish muscles before the experiment on the basis of dry weight, which amounted to 5.49 %, and we note a decrease in the percentage of ash in fish muscles before the experiment, on the basis of dry weight, of 4.25%. The results of the study showed that carbohydrates increased at the end of the experiment (from 0.00069 to 0.485). The results of our current study showed that the survival rate of fish was not affected by the survival rate in the months of the beginning of the experiment, October and November, except in the last months, December, January and February

I. INTRODUCTION

Fish farming has received great care in the past few years due to the increase in population numbers and the inability of other sources to meet the need (Al-Gharawi, 2012). The production of fish farming in the world has reached 44.2 million tons, of which 38.6 million tons are from freshwater fish farming and 5.6 million Tons of marine aquaculture. China captured more than 68% of the total production (Mohammed (2016). 68 species of fish are spread in Iraqi waters out of 10,000 species of freshwater fish classified globally, and the carp family is more widespread and diverse in Europe, Asia and North America (Awfi, 2015, Farhan, 2010, Ahmad 2017). The incentive that encouraged the establishment of fish farming in Iraq is the possession of vast water bodies that are characterized by their thermal diversity, and the diversity of cultured fish occurs. The low density of culture is economically unfeasible on the other hand, and the high density may lead This leads to stress on fish with the possibility of wounds, the spread of diseases and a decrease in immunity, as a result of overcrowding, and the deterioration of water quality, which then negatively affects the intake of processed feed and the efficiency of food conversion (Taher 2014). The importance of fish in Human life is old, and this importance has increased significantly with the population expansion due to the nutritional, health and environmental benefits of fish (Pauty and Zeller, 2019). Li,2021, and essential fatty amino acids, minerals and vitamins (and his group,Byrd,2020).

II. MATERIALS AND WORKING METHODS

field work

Samples were collected monthly from the study station, starting from the start of the experiment 2/9/2021 until 23/2/2022, as follows:

1- Collecting fish samples Fish samples were collected every month during the study period to take measurements of weights, the first and last meals were taken, muscles were taken and frozen to estimate the nutritional value.

2- Collection of water samples Water samples were taken from the study to perform some chemical and physical tests and the samples were collected in polyethylene plastic bottles with a capacity of 250 ml for each sample. Samples were taken to estimate the dissolved oxygen using glass bottles (Winclair bottles) with a capacity of 250 ml. Water temperature The water temperature was measured using Mercury thermometer graded from 0-100 periodically during fish weighing times. The water temperature was measured and the thermometer immersed in water. The operation was carried out in the morning to ensure the accuracy of the reading. pH The field pH meter was used, model HI8915, made by Hanna, Romania, after calibrating it with Buffer solutions (pH9,7,4). Salinity The electrical conductivity was measured using a TOA conductivity meter, model EGPW252, Jenway company, and the output was expressed in micro units. Siemens \ cm. And after multiplying the result by the constant 64.0 to extract the salinity values according to the method of (1978). Makarth et al and using the device The Multi parameter sampler (i350) German Origin W.T.W.

3- Estimation of the nutritional value

Moisture, crude protein, crude fiber and ash were determined for each of the ration and fish meat based on the standard methods described by A.O.A.C. (2000)) The dry matter in the ration and fish muscle was determined by drying the samples

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in an electric oven at a temperature of 105 °C until the weight was stable. The Micro-Kjeldahl method was used to estimate the total nitrogen in the forage model and fish muscles (before and after the experiment for the experimental muscles) and to extract the percentage of crude protein in the rations by multiplying the percentage of nitrogen by the factor 6.25. The percentage of crude fat was estimated by using the Soxolite device (Soxhlet Apparatus Weigh the dry model and place it in a soxolite beaker and use the organic solvent Petroleum Ether for a period of 16 hours with continuous heating. Evaporation of the organic solvent in an electric oven at a temperature of 105 for half an hour after which the sample was weighed and the percentage of crude fat was calculated. The ash percentage of the models was estimated Forage and fish muscles by burning the sample using a muffle furnace at a temperature of 600°C, and the process continued until the weight was stable.

III. RESULTS AND DISCUSSION

The chemical composition of the fish's body: protein The results of our study in Table (4) indicated that the percentage of protein in the muscles of fish after the experiment was the highest, reaching 5.76%, while the lowest percentage in the muscles of fish before the experiment amounted to 3.61 % that the percentage of protein decreased at the beginning of the experiment in When we notice an increase in the percentage of protein deposited in the fish body at the end of the experiment and this was confirmed by the study of Mahdi et al. (2006)) who showed that this difference in the protein content of the fish body is due to environmental differences, physiological status, age and availability of natural food, as well as confirmed (Cirkovic et al. 2011). al The difference in body components in fish according to age and breeding systems differs slightly in the protein content, whose body content is from 14 to 18%.Al-Mashaikhi (2016) explained in his study the high percentage of protein in the diet and the high percentage of protein in the natural food found in earthen ponds. It may also be the stress that fish have been exposed to at low temperatures, which may be the exploitation of protein to generate energy used for perpetuation and lead to a decrease in the liver enzyme ALB - Albumin, which leads to death A problem in the kidneys, which leads to a loss of excessive protein intake (Tan and his group, 2018). Farhan (2016) indicated in a study at 49.17 g for a period of 3 months of common carp fish that the protein content increased from 81.58 to 20 48, based on dry weight, which is Higher than the results of our study, and in the cocoa study (2019) for the period from November 15, 2017 to July 15, 2019 for fish between weight 27.85 to 850 grams, the protein percentage was 16.10% on the basis of wet weight. And in the study of Galit (2020) the protein percentage was 14.79 when Breeding fish with an average weight of 12.25 g / fish in glass tanks. Fat The results of the experiment showed when analyzed on the basis of dry weight Table (1) There is a difference in the percentage of fat in the chemical analysis of fish muscles before the experiment was 0.0048 %, while the percentage of fat in fish was 39% Chemical analysis of fish muscles after the experiment, and this may be due to the large size of the fish during the duration of the experiment after the addition that I relied on in part of the feeding on the natural food found in the ponds, as the content of fatty acids decreases when supplementary feeding with natural food (Cirkovic 2010) pointed out (Bogut 2007)) until Joe D An abundance of zooplankton and phytoplankton in earthen ponds has a role in increasing the percentage of fat in the components of the fish body. He (Marcu, 2010) and his group indicated that the increase in body weight with a decrease in the moisture content in the body and the proportion of protein and the increase in the proportion of fat and ash in

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the body. Carbohydrates in the diet and the adoption of fish before the experiment by feeding on them led to an increase in the concentration of fat in them (Hadid and Ali, 1991) There are wide ranges of fat content in carp from 2.3 to 16.8%. With the fat content of Cirkovic 2011 (and his group) the fatty acids can vary greatly depending on gender, temperature, food source and season (Broyerl 2012), while Al-Khalaf and Khouribet (2014) indicated that the fat content of river carp fish is 2.02%. Al-Mahnawi mentioned (2006) that the fat content of common carp fish was 1.52%, and Abdel Rahman's study indicated that the percentage of fat was (6,33% -13,66%). The percentage of fat was 3.19 in fish fed compound feed (Dragana 2012) and in a study Mohesn 2012) The percentage of fat was 1.36 in the raised fish Ashes in earthen ponds weighing 5 g / fish. The current study showed a rise in the percentage of ash in fish muscles before the experiment on the basis of dry weight, which amounted to 5.49 %, while we notice a decrease in the percentage of ash in fish muscles after the experiment by 4.25%. Al-Mahanawy found (2006) that the ash content in the body of carp fish was 2,31%, and Marcu et al. (2010) indicated that with an increase in body weight, the percentage of ash in the body decreased, and in the study of Moheson (2012) ash 13.6 in fish raised in ponds Soil weight was 5 g/fish on a dry weight basis, which is close to the results of our study. While the study of Al-Mashaikhi (2016) indicated that the percentage of ash was (1,50%), while the study of Farhan (2016) at a weight of 49.17 grams for common carp fish indicated that the percentage of ash decreased from 5.64 to 5.60. Abdul Rahman (2018) The ash content (2.35% - 1.01%) in common carp. Carbohydrates The results of the study in Table (1) showed that carbohydrates increased at the end of the experiment (from 0.00069 to 0.485), as the study (and his group) Markovic 2009 indicated, that the quality in the semi-intensive system is usually of low quality and carbohydrates constitute high percentages in the components of the body For common carp, the study of Mahdi et al. (2006) showed that the percentage of carbohydrates in the meat of carp fish was 1.30% on a wet weight basis, while the study of Al-Mashaikhi (2016) showed that the highest percentage of carbohydrates was 0.73% on a wet weight basis.

Table No. (1) shows the chemical analysis of muscles of common carp fish cultured in lakes on the basis of dry weight before the start of the experiment and after the

Ingredients %	Experiment Chemical composition of the fish before the start of the%	Experiment Chemical composition of the fish after the experiment %
Protein	3.61	5.76
Fat	0.0048	39
Carbohydrates	0.0069	0.485
Ash	5.49	4.25

The results of analyzes of the muscles of the body of fish raised in lakes showed that there is a difference in the ratios of muscle components at the beginning of the experiment and at the end of the experiment. The highest percentage of protein was recorded at the end of the experiment, while it was the lowest at the beginning of the experiment. While the percentage

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of ash at the beginning of the experiment was higher than the percentage at the beginning of the experiment. As for carbohydrates and fats, the highest percentage of them reached at the end of the experiment and the lowest at the beginning of the experiment. (Marcu et al 2010) indicated that the increase in body weight decreases according to the decrease in the moisture content in the body and the percentage of protein and the percentage of fat and ash in the body increases. Also, the increase in carbohydrates in The diet and the adoption of fish before the experiment by feeding on it led to an increase in the concentration of fat in it (Hadid and Ali, 1991) There are wide ranges of fat content in carp from 2.3 to 16.8%. Fats (Cirkovic et al 2011) Fatty acids can vary greatly depending on gender, temperature, food source and season (Broyerl 2012), while Al-Khalaf and Kharib (2014) indicated that the content of carp fish The fat content was 2.02%. Al-Mahnawi (2006) stated that the fat content of common carp fish was 1.52%, and Abdel Rahman's study indicated that the percentage of fat was (6,33% - 13,66%). The percentage of fat was 3.19 in Fish fed on compound feed (Dragana 2012) and in the study of Mohesn 2012) the percentage of fat was 1.36 in fish raised in earthen ponds with a weight of 5 g / fish.

survival rate

It is the ratio of the total number of live fish at the end of breeding to the total initial number of fish at the beginning of the breeding period. The results of our current study showed that the survival rate of fish was not affected by the survival rate in the months of the experiment, except in the last months, as shown in Table (2), perhaps as a result of Due to the low temperatures, which led to the death of some fish, which was indicated by a study (and his group Bhatnager, 2008) that temperatures below 12 degrees Celsius lead to the death of the largest number of fish.

Table No. (2) shows the survival rate

Total number of fish	Number of deaths at the beginning of the trial months	Number of deaths at the end of the trial months	Survival rate
1000	%1	150 fish	%85

Feasibility Study

The importance of the economic feasibility study for each project is increasing for the purpose of directing the available resources thanks to a form, which is called rational use (Al-Mousawi and Diwan, 2018). Fish play a prominent economic role in developing countries (Jubeir 2012). Knowing the percentage of the contribution of fixed and variable costs is important for the breeder, as the variable costs include production requirements such as the costs of feed, fish, labour, fuel, marketing costs and others (Sabri, 2006), while fixed costs include equipment, buildings, machinery, furniture and others. It was found that variable costs constitute more than 83% of production costs. While the total fixed costs constitute about 17% of the total

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production costs and the reason for the high variable costs is due to the high costs of feed (Al-Dulaimi, 2003). Expenses included accounts of fixed costs from purchasing feed, wages, transportation of materials, etc. The price of buying fish and other costs were also calculated. Irrigation, such as the wages of transport and workers. The amount of consumed fodder was calculated, which amounted to 5 tons), then according to the amount spent to purchase the fodder, it amounted to 850,000, and the price of the suffixes was calculated and the price of one with the transport wages was estimated at 500 Iraqi dinars for one staple, only the total purchase amounts were 500,000 dinars. The wages of workers for the farmer were estimated at a reasonable amount And over the length of the experiment 10000500. The results of the current experiment are in agreement with the results of Taher (2014), which indicated that the best productivity was achieved for common carp fish cultured in floating cages. The results of the profit coefficient in the current study are close to the results of the study (Nasir, 2013). It was found that the profit coefficient of common carp fish Raised in floating cages ranged between 127,93.

Table No. (3) shows the economic feasibility with net profit and profit coefficient

Article Number of fish	1000 / fish / m3
The price of the sufficiency / Iraqi dinars with transportation	500,000
Feed quantity / kg	5 tons
Feed price / JD	850000
Labor wages	1000500
Selling Price/Kg Revenue	6000000
Total expenses	5000000
net profit	1000000
Profit factor	20

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