Investigate the Effect of Added Gray Garlic (Allium Sativum L) On Plates and Body Compounds of Nile Tilapia (Oreochromis Niloticus) Ahmad Abdallah Ahmad Al Khraisat National Agricultural Research Center (NARC), Livestock Research Directorates, Fishers Research Department, Baqa’a, Jordan, P.O. Box 639 – Baqa’a 19381 Jordan, Mobile: +962 775 540 533 Email: a.khrisat@hotmail.com Abstract: We conducted a nutrition study to investigate the effects of Garlic Powder (Allium sativum L) on the function and structure of Nile tilapia (Oreochromis Niloticus). Five isitrogen and low-fat diets were prepared, with high concentrations of 0 (regulated), 15, 30, 45, and 60 g / kg. Three tilapias (15 per container) were manually fed, each with an initial weight of 22.60±0.04 grams, with visual satiety as the main factor, two meals a day for 8 weeks. Test results showed that growth and nutritional performance improved across treatment compared to the control group. But the results showed the final weight gain, weight gain (WGR%), growth rate (SGR) and the feed stock rate (FCR) of the fish fed garlic powder 30g / kg each time. Fish and add 30 g / kg of garlic feed to the highest protein feed. Fish adipose tissue also showed a significant reduction in regulatory group reduction. The powdered garlic will not seriously affect the humidity and ash content. Based on the results of growth and body structure of fish, it can be concluded that garlic powder 30 g / kg has good growth and body structure of Nile tilapia. Keywords: Gray Garlic, Nile Tilapia (Oreochromis Niloticus), Height, Body Composition. Introduction : Nutritious food in livestock production systems is essential to the production of quality products. On a fish farm, nutrition is as important as eating 40-50% of the cost of production. In recent years, fish consumption has changed dramatically with the development of cheaper foods to ensure the health of fish. The development of specific food formulas supports the maritime industry (fish farming), which is growing to meet the growing demand for fish and seafood products. It is affordable, secure and of the highest quality (Craig and Helfrich, 2002). Garlic has been used for hundreds of years as a spice and is often used in medicine as a dietary supplement and nutritional supplement (Sallam, 2004; Mansoub, 2011; in ongoing Stanačev, 2011), is a valuable source of calcium and phosphorus; It has a high carbohydrate content, so has a high nutritional value. It contains iodized salt which has a positive effect on the cardiovascular system and arthritis, silicate has a positive effect on the skeletal system, sulfur salts have a positive effect on bone, blood cholesterol and liver disease. Another key ingredient is alizarin, which has an insect repellent effect (Gabor et al., 2012). Recently, Salah (2012) reported that it contains 17% protein, 0.8% fat, 3% minerals, and different amounts of vitamins (thiamine, riboflavin and niacin) and enzymes (allinase, peroxidase and myrosinase). It also contains 0.2% essential oils, which is especially notable when the plant is finished in powder form. Garlic is a natural food supplement that helps improve food intake and therefore reduces food costs (Corzo-Martinez et al., 2007; Rehman and Munir, 2015). Garlic (Allium sativum) is perhaps one of the first known plant species and has been used to improve the growth and resilience of cattle and fish (Megbowon et al., 2013). Greece is an important medicinal plant that is grown in many countries. It is used as a diet for humans and animals and to treat many diseases in traditional medicine (Shalaby et al., 2006). Today, antibiotics are often used to treat and control or reduce the spread of infectious diseases, so natural ingredients are essential for the prevention of side effects (Farahi et al., 2010). The study was performed to examine the activity of the additional garlic powder (Allium sativum L) in the immune system and body of Nile Tilapia (Oreochromis Niloticus). 1 Fish
farming: fingers of small tilapia (Oreochromis niloticus) collected from Ghour Al Safi Aquaculture/NARC, Karak District, Jordan. Before starting the experiment, all harvested fish were placed in a rectangular Glass aquarium where they were fed commercial food for 2 weeks (recommended period) under laboratory conditions. The body weight of the fingers was 22 g (meaning the original weight was 22.60 ± 0.04 g). The fish was automatically divided and divided into four equal groups using a protein of 27.91% CP. There are 15 fish in each aquarium. Each therapist is replaced by three imitations of aquariums. Each aquarium with a size of 60 cm × 60 cm × 80 cm is filled with 175 liters of water, pumped water with full chlorine is provided, and 30 cm long air stone is used for the air of the aquarium water. During the experiment, the water temperature was 25.49 ± 0.78 °C, the oxygen dissipation was 7.69 ± 0.55 mg / L and the pH was 7.13 ± 0.19. and also. Lighting is controlled by transmission over 14 hours: 10 hours according to daytime photoperiod. Fish and debris was removed by respiration and about 50 percent of the water in each aquarium was replaced daily with fresh water. 2- Feeding: New tubers bought from the local market (Dearalla, Balqa Government, Jordan). After peeling, the garlic is cut into small pieces, dried in the wind for 5 days and then mixed in order, mixing accordingly. Prepared tablets, dried at room temperature for 24 hours and stored in a refrigerator (4 °C). A balanced batch is prepared (2 Tables). The products are sourced from a wide range of suppliers and are available online at the Dahret al Ramel Fish Feed Center (NCARE) in the form of paper bulbs. The basic lining was prepared by grinding the grain into grains with a 0.5 mm mesh. The ingredients and oil (corn oil) slowly add the mixture by hand for 15 minutes to ensure uniformity of the ingredients. Add water (600 ml) until the mixture begins to thicken. The plates are then prepared using a 0.5 cm thick lubricating machine. Store the packaging plate for 24 hours to dry the air and store in the refrigerator (4 °C) for daily use. Fish are fed at 3% animal weight; The daily dose was entered into 2 standard meals at 9 and 14 hours for eight weeks. Fish were measured every two weeks during the test period and food quality was restored according to body changes. Table (1) shows the chemical analysis of the feed ingredients used in the test diet. These diets have been reported to contain nitrogen (27.91% crude protein) and isocaloric (2370 kcal / Kg DM). The composition of the diet is presented in table (2). Table 1. Proximate analysis of the tested ingredients (% on DM basis). Ingredients DM CP EE CF Ash NFE%* GE Kcal/kg** Concentrated poultry feed 92.24 33.14 4.2 10.41 16.19 36.06 371.1 Soybean meal 92.4 48.6 1.76 2.55 8 39.09 449 Yellow corn 89.72 8.68 4.17 1.21 1.31 84.63 435 Wheat bran 89.05 16.13 3.42 9.81 5.41 65.23 390.1 Barley 91.75 10.89 2.08 4.46 3.06 79.51 406.6 *NFE= 100-(CP + EE + CF + Ash). **Gross energy was calculated by multiplication the factors 4.1, 5.6 and 9.44 kcal GE/g DM carbohydrate, protein and fat, respectively (Jobling, 1983). Table 2. Composition of the experimental diets. Dietary composition Experimental Diets 0% 1.5% 3% 4.5% 6% Concentrated poultry feed a 20 20 20 20 20 Yellow corn 20 20 20 20 20 Soybean meal 33 33 33 33 33 Barley 10 10 10 10 10 Wheat bran 15 15 15 15 15 Corn Oil b 0.5 0.5 0.5 0.5 0.5 Starch 0.5 0.5 0.5 0.5 0.5 Vitamin premix c 0.25 0.25 0.25 0.25 0.25 Mineral premix d 0.25 0.25 0.25 0.25 0.25 Salt (NaCl) 0.5 0.5 0.5 0.5 0.5 Limestone (CaCO2) 0.5 0.5 0.5 0.5 0.5 Garlic Powder (Feed Additive) 0 1.5 3 4.5 6 Corn Starch (Binder Additive) 0.5 0.5 0.5 0.5 0.5 Proximate Analyses (DM) Dry matter (DM) 89.42 89.42 89.42 89.42 89.42 Crude protein (%) 27.91 27.91 27.91 27.91 27.91 Crude fat (%) 5.08 5.08 5.08 5.08 5.08 Energy(kcal/100gr) 237 237 237 237 237 a Concentrated Poultry Feed ,
Brocon-10 special, Wafa Agricultural Co. Ltd, Amman Jordan b Corn Oil, Jordan c Vitamin Premix (Composition Per 1kg): A=1600000 IU, D3=400000 IU, E=40000 mg, K3=2000 mg, B1=6000 mg, B2=8000 mg, B3=12000 mg, B5=40000 mg, B6=4000 mg, B9=2000 mg, B12=8 mg, H2=40 mg, C=60000 mg, Inositol=20000 mg d Mineral premix (composition per 1kg): Iron:6000 mg, Zinc:10000 mg, Selenium:20 mg, Cobalt: 100 mg, Copper:6000 mg, Manganese:5000 mg, Iodine:600 mg, CoCl2:6000 mg DM, dry matter. 3– Growth Parameters: vegetation growth (WG), income ratio (WG%), special growth (SGR), food comparison (FCR) and survival (SR). are calculated according to the following figures: a- WG (g / fish) = [final weight (g) – initial weight (g)]. b- Body weight = = (starting first weight) / first weight] × 100 c- SGR (% / day) = [Last body weight – Ln body weight] × 100 / way sim level (d). d- FCR = diet, dry weight (g) / living weight increased. e SR = 100 [Total number of fish at the end of the test / Total number of fish at the beginning of the test. 4–Intermediate Study: 5 fish from each aquatic fish were sampled and stored in a refrigerator to hold them tightly together at the end of the experiment. According to the AOAC method (2002), the food and fish were analyzed in detail. Using Kjeldahl Auto, the brown protein content was completed by the Kjeldahl method. The crude lipid was extracted with the ether extract, oven humidity was dried at 105 °C for 24 hours. And ash with heating (550 °C for 4 hours). 5– Calculation of Data: In short, the design and completion of this course is not properly protected. The Shapiro–Wilk test was used to collect all the distributed data, and there was a significant difference between ANOVA (one ANOVA method) and different levels (p<0.055) after the Duncan test. All data and activities were analyzed through SPSS 19 procedures. Results: The results of developmental activity of Nile tilapia (Oreochromis niloticus) on fish diet Experimental diets are presented in Table 3. Experimental results compared with the control group, the use of garlic in fish feed may increase the activity of the whole treatment process. However, compared with the control group, the growth of the fish–fed subgroup and the 30 g / kg meat–eating stalks were higher (p Table 4. Proximate composition (%) of the whole body of Nile tilapia fish fed the experimental diet for 8 week. Diets Con 1.5% 3% 4.5% 6% Crude protein 14.33±0.14a 14.70±0.20ab 15.04±0.18b 14.96±0.09ab 14.89±0.39ab Crude lipid 8.34±0.09a 7.71±0.09b 7.32±0.12b 7.38±0.10b 7.37±.16b Moisture 71.33±0.22ns 71.40±0.19 72.23±0.23 71.91±0.10 71.80±0.31 Ash 3.41±0.18ns 3.67±0.14 3.73±0.14 3.74±0.13 3.81±.05 1- Values (mean ± SE of three replication) in the same row not sharing a common superscript are significantly different (P<0.05). 2- ns= not significant (P>0.05). ACKNOWLEDGEMENT The study was funded by JICA (Japanese Agency for International Cooperation) Division 3 and the National Agricultural Research Center (NARC) in Jordan. The author would like to thank Mr. Omar Balawenh who participated in this study. References 1– Craig S, Helfrich LA. 2002. Understanding fish nutrition, Feeds, and Feeding. Virginia Cooperative Extension, 1–9 p. 2– Sallam, Kh. I., M. Ishioroshi and Samejima, K. 2004 Antioxidant and antimicrobial effects of garlic in chicken sausage. Lebenswiss Technol. 37(8) 849–855. 3– Mansoub, N. H. 2011. Comparative effects of using garlic as probiotic on performance and serum composition of broiler chickens. Annals of Biological Research, 2(3):486–490. 4– Stanaće, V., Glamočić, D, Milošević, N., Puvara, N., Stanaće, V. and Plavša, N. 2011 Effect of garlic (allium sativum l.) in fattening chicks nutrition. African Journal of Agricultural Research 6:4:. 943–948. 5– Gabor EF, Şara A, Benėea M, Creăa C, Baciu A. 2012. The effect of phytoadditive combination and growth performances and meat.