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RESPONSE OF NILE TILAPIA, *OREOCHROMIS NILOTICUS* TO DIETS SUPPLEMENTED WITH DIFFERENT LEVELS OF FENNEL SEEDS MEAL (*FOENICULUM VULGARE*)

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Abstract

The present study was carried out to investigate the effect of fennel (*Foeniculum vulgare*) seed meal (FLSM) incorporation at different dietary levels on growth performance and nutrients utilization of Nile tilapia *(Oreochromis niloticus)* (4.5 g). This study was preformed in 12 glass aquaria (100 L. capacity per each one) to represent four dietary treatments of FLSM supplementation (0.0, 1.0, 2.0 and 3 %). All experimental diets were formulated to be is-nitrogenous (30.64 % crude protein) and iso-caloric (4.73 kcal./g diet gross energy) The tested diets were given to fish at a daily rate of 3 % of the live fish biomass each aquarium. The daily feed amount was offered in three equal parts daily at 8.00, 12.00 and 3.00; 6 days a week for 14 weeks. Fish were weighted every two weeks and feed amounts were re-adjusted accordingly. The experimental aquaria were stocked with 20 fish each and the experimental aquaria were provided with air through a compressor via air stoned. The experimental aquaria were cleaned every day, fish faces were removed by siphoning. The highest final weight; gains in body weight, daily gain and

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specific growth rate (P<0.05) were recorded by fish group fed 1 % FLSM. The best feed conversion ratios (FCR) were recorded by fish groups fed 1 or 2 % FLSM. All FLSM-supplemented groups recorded significantly (P<0.05) higher feed conversion ratios and protein efficiency ratios compared to the control group. No differences significant effects in whole body moisture, crude protein, lipid and ash content due to FLSM supplements ration. Supplementing Nile tilapia diets with 1, 2 and 3 % of FLSM reduced the costs of one kg gain in weight by 16.36; 14.92 and 8.22 %, respectively compared to the control group. Based on the obtained results it could be recommended the supplementation of growing Nile tilapia diets with 1 % of FLSM; this level improved the fish growth performance, nutrient utilization and decreased the costs of production of 1 kg gain in weight.

Keywords: Fennel seeds meal, medicinal plants, Nile tilapia, growth performance, feed additives, body composition, and economic evaluation.

INTRODUCTION

Nowadays Herbal medical is a growing area of alternative medicines and many of the active ingredients in manufactured drugs are derived originally from plant materials. It is believed that natural plant compounds are less toxic and safer than prepared chemical compounds. The use of natural products is becoming more popular, since drugs of synthetic origin may have a negative impact on the environment and parasite resistance to poisonous chemicals can develop after repeated applications (Magi and Sahk, 2003).

The use of medicinal herbs as growth promoters is becoming useful for fish feeding rather than classic chemical feed additives because of the accumulative effect of the chemical compounds which induced deterrent effects on human health (El-Dakar *et al*., 2008).

Fennel (*Foeniculum vulgare*) is a plant belonging to the umbelliferae (Apiaceae) family, known and used by humans since antiquity. It was cultivated in every country surrounding the Mediterranean Sea because of its good flavor (Muckenstrum *et al.*, 1997). It is rich in calcium phosphorous and magnesium and contained potassium, iron, zinc, manganese, fatty acid especially18: 1 (71.31 %) and 18: 2 (11.66%) and carbohydrates (61 %) (Abdel-Azeem, 2006). Also, it is rich in isoleucine and histidine (Abo- Raiia *et al.*, 1991). Fennel is a good herb for the entire digestive system as a laxative, appetite stimulant, antispasmodic and carminative, relieves abdominal pain, and is useful for gastrointestinal and colon disorders. Fennel acts as a mild expectorant; useful for coughs or bronchitis and to resolve phlegm, promotes liver and kidney function and health (Simon *et al.*, 1984).

In Egypt, Nile tilapia *(Orochromis niloticus)* is a major species in aquaculture systems and much appreciated by consumers. However, the success of tilapia culture depends to a large extent on artificial feeding especially as farming systems intensify (El-Sayed, 2006).The objective of the present study was to evaluate the use of fennel seeds meal (FLSM*)* as a feed additive in fish diet and its impact on growth performance, feed utilization, whole- body composition of Nile tilapia.

MATERIALS AND METHODS

Diet preparation and feeding regime:

Four experimental diets were formulated (30% crude protein and 7% lipid) containing different levels 0.0, 1.0, 2.0 and 3.0 % of FLSM (Table1). The proximate chemical composition of the main ingredients in the diets was analyzed and is shown in Table (2). In the present study; fennel (natural product) was obtained from local market. The dry ingredients of each diet were thoroughly mixed and 100 mL of water was added per kg diet. Afterwards, the mixture (ingredients and water) were blended using kitchen blender to make a paste of each diet. Pelleting of each diet was carried out by passing the blended mixture through laboratory pelleting machine with a

1mm diameter matrix. The pellets were dried in a drying oven (Fisher oven 13 – 261 – 28A state country) for 24 hours at 65°C and stored in plastic bags which were kept in a refrigerator at (-2° c to avoid rancidity. Experimental diets were formulated to meet the nutritional requirement of the tilapia fish (NRC, 1994).

Table (1): composition of the experimental diets.

Ingredients	Control (0.0)	Fennel seeds meal %		
		1 %	2.0 %	3.0 %
Herring fish meal	9.10	9.10	9.10	9.10
Soybean meal	52.57	52.57	52.57	52.57
Corn meal	22.08	22.08	22.08	22.08
Starch	6.00	5.00	4.00	3.00
Fennel seeds meal	0.00	1.00	2.00	3.00
Cod liver oil	2.14	2.14	2.14	2.14
Corn oil	2.11	2.11	2.11	2.11
Cellulose	3.0	3.0	3.0	3.0
Vitamins premix*	1.00	1.00	1.00	1.00
Minerals premix**	2.00	2.00	2.00	2.00
Total	100	100	100	100

* Mineral premix (per kg of premix): $CaHPO_4.2H_2O$, 727.2 g; $MgCO_4.7H_2O$, 127.5 g; KCl 50.0 g; NaCl, 60.0 g; $FeC_6H_5O_7.3H_2O$, 25.0 g; $ZnCO_3$, 5.5 g; $MnCl_2.4H_2O$, 2.5 g; $Cu(OAc)_2.H_2O$, 0.785 g; $CoCl_3.6H_2O$, 0.477 g; $CaIO_3.6H_2O$, 0.295 g; $CrCl_3.6H_2O$, 0.128 g; $AlCl_3.6H_2O$, 0.54 g; Na_2SeO_3, 0.03 g.

** Vitamin premix (per kg of premix): thiamine, 2.5 g; riboflavin, 2.5 g; pyridoxine, 2.0 g; inositol, 100.0 g; biotin, 0.3 g; pantothenic acid, 100.0 g; folic acid, 0.75 g; para-aminobenzoic acid, 2.5 g; choline, 200.0 g; nicotinic acid, 10.0 g; cyanocobalamine, 0.005 g; α-tocopherol acetate, 20.1 g; menadione, 2.0 g; retinol palmitate, 100,000 IU; cholecalciferol, 500,000 IU.

Table (2): Proximate chemical analysis of fennel seeds meal (FLSM) and experimental diets (% on dry matter basis).

Items	Experimental diets				
	FLSM	**0. 0 %**	**1.0%**	**2 %**	**3 0%**
Dry matter	97.87	91.28	91.15	91.35	91.26
Crude protein	32.88	30.12	30.30	30.41	30.32
Crude fat	7.62	7.19	7.24	7.22	7.36
Ash	5.01	8.34	8.36	8.45	8.25
Fiber	6.88	5.25	5.57	5.47	5.29
NFE[1]	47.61	49.10	48.53	48.45	48.78
G.E. Kcal/100g[2]	453.05	439.55	438.70	438.8	440.97

[1] NFE (nitrogen free extract) = 100 – (protein % + lipid % + ash % + fiber %).

[2] GE (gross energy) was calculated after NRC (1993) as 5.64, 9.44 and 4.11 Kcal/g for protein, lipid and NFE, respectively.

Fish culture technique:

The present study was carried out at the Central Laboratory, of Aquaculture Research, (CLAR) Abbassa, Abo-Hammad, Al-Sharkia Governorate. Nile tilapia (4.5 g) were obtained from fish hatchery, CLAR. and kept under the same environmental conditions in fiberglass tanks for 2 weeks for adaptation. Fish were fed the control diet (30% crude protein) during acclimatization period.

Fish were randomly distributed in to 12 experimental glass aquarium (100 L. capacity per each one) into 4 treatments (12 aquaria) with 20 fish per aquarium. The aquarium was cleaned and two thirds of the aquariums water was replaced every day. Each aquarium was also supplied with air produced by a small compressor. Water temperature and dissolved oxygen were recorded weekly. Other water quality parameters including pH, and ammonia were periodically measured every 2 weeks. The photoperiod was set on a 12-12 hour light-dark cycle using fluorescent tubes. The test diets were fed to triplicate groups of fish at a daily rate of 3 % of live fish biomass, during the course of the experiment. Fish from each aquarium were collectively weighed

every two weeks. Diets given to fish in three equal parts daily at 8.00, 12.00 and 3.00, and the ration was adjusted each time the fish were weighed. The feeding rate was 3 % of fish body weight during experimental period.

Chemical Analysis of Diets and Fish whole bodies.

The tested diets and whole-fish body from each treatment at the beginning and at the end of experiment were analyzed according to the standard methods of AOAC (1990) for moisture, protein, fat and ash. Moisture content was estimated by drying the samples at 85 °C in an oven (GCA, model 18 EM, precision scientific group, Chicago, Illinois, USA) to constant weight and weight loss was calculated. Nitrogen content was measured using a microkjeldahl apparatus Labconco (Labconco Corporation, Kansas, Missouri, USA) and crude protein was estimated by multiplying nitrogen content by 6.25. Total lipids content was determined by ether extraction in the multi-unit extraction Soxhlet apparatus (Lab-Line Instruments, Inc., Melrose Park, Illinois, USA) for 16 hours using patrolium ether and ash was determined by combusting samples at 550°C for 6 hours in a muffle furnace (Thermolyne Corporation, Dubuque, Iowa, USA). Crude fiber was estimated according to the method of Goering and Van Soest (1970).

Analysis of water quality parameters:

Water samples were collected biweekly from each aquarium. Water temperature and dissolved oxygen were measured on site with a YSI model 58 oxygen meter (Yellow Spring Instrument Co., Yellow Springs, Ohio, USA). The pH was measured using a pH-meter (Digital Mini-pH Meter, model 55, Fisher Scientific, USA). Unionized ammonia was measured using DREL/2 HACH kits (HACH Co., Loveland, Co., USA).

Parameters of growth and feed utilization:

Growth performance parameters were determined and feed utilization measurements was calculated as follows:

Weight gain = W2 – W1;

Specific growth rate (SGR) = 100 (ln W2 – ln W1) / T; where W1 and W2 are the initial and final weights, respectively, and T is the number of days of the feeding period;

Feed conversion ratio (FCR) = feed intake / weight gain;

Feed efficiency ratio (FER) = weight gain/ feed intake;

Protein efficiency ratio (PER) = weight gain / protein intake;

Apparent protein utilization (APU; %) =100 [protein gain in fish (g) / protein intake in diet (g)];

Energy utilization (EU; %) =100 [Energy gain in fish (g) / energy intake in diet.

Economical evaluation:

The cost of feed required to produce a unit gain of fish biomass was estimated using a simple economic analysis. The estimation was based on the local retail sale market price of all the dietary ingredients during the time of this study. These prices (in LE/kg) were as follows: herring fish meal, 8; soybean meal, 2.; corn meal, 1.50; wheat bran, 1.0; starch 2.5, cellulose 2.0; fish oil, 7.0; corn oil, 5.0; vitamin premix, 7.0; mineral mixture, 3.0; fennel seeds 5 LE, respectively.

Statistical analysis:

The data obtained were subjected to a one-way analysis of variance to evaluate the effect of FLSM. Differences between means were tested at the 5% probability level using Duncan's new multiple range tests. All the statistical analyses were performed using SPSS programversion10 (SPSS, Richmond, VA, USA) as described by (Dytham 1999).

RESULTS AND DISCUSSION

The ranges of water temperature; dissolved oxygen; total ammonia and pH, in aquaria varied during the study period and their ranges were 26.5 - 28.5 °C, 6.2 - 6.8 mg/l, 0.3 – 0.5 mg/l and 7.6 - 8.1,.respectively. These data are within the acceptable ranges required for normal growth of Nile tilapia as mentioned by Boyd (1990).

Results in Table (2) indicated that experimental diets were isonitrogenous and isocaloric containing approximately (30.6 % crude protein) and gross energy (4729.2 kcal/kg diet). Moreover FLSM was rich in crude protein, total lipid, nitrogen free extract, and crude fiber, (2.88, 7.62, 47.61 and 6.88 % respectively).

As presented in Table (3) results revealed that the fish groups fed 1% and 2 % FLSM showed significantly ($P<0.05$) higher final weight, total body weight gain, SGR and daily gain in weight, followed in a significant ($P<0.05$) decreasing order by the FLSM 3 % and the control group. These results may indicate that supplementing Nile tilapia diets with FLSM improved the growth performance compared to the control group. This improvement was more pronounced when fish fed 1 % FLSM. No significant differences were observed in fish survival rate among different treatments ($P>0.05$), since it ranged from 96.67 to 98.33 %.

These results are agreement with those of El-Dakar *et al.* (2005) who found that shrimp fed tested fennel seeds meals exhibited higher body weight, weight gain and SGR than those fed the control diet. Ahmad *et al.* (2009) found that Nile tilapia fed on diet containing 1% cinnamon meal showed the highest average body weight, weight gain, and SGR in comparison to other diets, while the lowest performance was observed in fish fed control diet (without cinnamon meal). Also, Seden *et al.* (2009) showed that, the maximum growth Nile tilapia growth (final weight, weight gain and SGR) was obtained when fish fed the diet contained 1% of *Origanum vulgare*, while the lowest growth was obtained by the control group. The growth

performance enhancement in the present study may be due to FLSM are rich in calcium phosphorous and magnesium and contained considerable amounts of potassium, iron, zinc and manganese. The positive effect of fennel may due to the fact that it contains also the fatty acids 18: 1 (71.31 %) and 18: 2 (11.66%), and it's rich in total carbohydrates (61 %) (Abdel - Azeem, 2006).

Similar results were obtained with different medicinal plants that used as natural growth promoters resulting in significant improvements on body weight, weight gain, survival rate and FCR in fish (Shalaby, 2004, El Dakar, 2004, Ahmad *et al*. 2009 and Seden *et al*. (2009).

Table: (3) Growth performance for Nile tilapia fry, fed on different dietary fennel seeds meal (FLSM) levels. For 14 weeks.

Diets / Items	Control	FLSM levels		
	(0.0)	1%	2%	3 %
Initial weight (g)	4.37 ± 0.04^{a}	4.43 ± 0.04^{a}	4.47 ± 0.04^{a}	4.40 ± 0.04^{a}
Final weight (g)	14.1 ± 0.44^{c}	18.3 ± 0.43^{a}	17.9 ± 0.43^{a}	16.3 ± 0.43^{b}
Body weight gain	9.73 ± 0.39^{c}	13.87 ± 0.39^{a}	13.43 ± 0.39^{a}	11.90 ± 0.39^{b}
Specific growth rate (% / day)	1.20 ± 0.023^{c}	1.45 ± 0.023^{a}	1.42 ± 0.023^{a}	1.34 ± 0.023^{b}
Daily rate gain (g / day)	0.10 ± 0.37^{c}	0.14 ± 0.37^{a}	0.14 ± 0.37^{a}	0.12 ± 0.37^{b}
Survival rate (%)	96.67 ± 0.3^{a}	98.33 ± 0.04^{a}	98.33 ± 0.04^{a}	98.33 ± 0.04^{a}

Means the same letter in the same row is not significantly different at ($P<0.05$).

Data in Table (4) indicated that feed intake increased significantly ($P< 0.05$) in FLSM –supplemented diets. Fish fed on diets containing 1% FLSM consumed more diet than other treatments. FCR improved (decreased) significantly ($P < 0.05$) in diets containing different levels of FLSM. The best FCR was obtained in diet containing 1 % FLSM. Data showed also that FER and PER were significantly ($P<0.05$) higher at diets containing different levels of FLSM. The highest FER and PER were obtained with the diet containing 1 % FLSM in comparison to the control, which exhibited the

lowest FER and PER values. Increased feed intake in FLSM diets was the result of a high demand for nutrients with stimulated growth and / or due to improved appetite because of sensory stimulation resulting from the presence of FLSM in the feed. The poorest FCR was obtained at the control diet, and the best FER and PER were obtained when fish fed diet contained 1% of *Origanum vulgar* compared with control diet. Sakr (2003 and El-Dakar *et al.* (2004) showed similar results with different spices e.g. marjoram, basil, peppermint and anise for tilapia. Platel *et al.* (2002) found that spices are desirable for stimulating digestion, and had the highest stimulatory influence particularly on bile secretion and pancreatic enzymes activity. In anther way, olfactory feed ingredients enhanced growth through their ability to act as feeding enhancers by fish to eat more feed than in normal un-supplemented diets (Adams *et al*., 1988).

Table (4): Feed intake, feed conversion ratio (FCR), feed efficiency ratio (FER), protein efficiency ratio (PER) of Nile tilapia fed diets containing different levels of fennel seeds meal (FLSM).

Items	(control) 0.0	FLSM levels.		
		1%	2 %	3 %
Feed intake (g feed/fish)	23.97±0.41^{c}	28.05±0.41^{a}	27.35±0.41^{a}	25.85±0.41^{b}
FCR	2.46 ± 0.05^{c}	2.02 ± 0.05^{a}	2.04 ± 0.05^{a}	2.17 ± 0.05^{b}
FER	40.59 ± 1.01^{b}	49.45 ± 1.00^{a}	49.10 ± 1.11^{a}	46.03 ± 1.21^{a}
PER	1.48 ± 0.08^{b}	1.79 ± 0.06^{a}	1.77 ± 0.11^{a}	1.66 ± 0.71^{a}

Means the same letter in the same row is not significantly different at (P<0.05).

Similarly, El-Saidy (1999) reported that feed consumption was higher in the onion-fed Nile tilapia throughout the experimental period and the control group exhibited the lowest feed intake. Also, Ahmad *et al.* (2009) found that diet intake increased significantly (P<0.05), while FCR decreased significantly by supplementing the diets with different levels of cinnamon meal. Moreover FER and PER values increased significantly with

supplementing the diets with cinnamon meal at level 1 or 1.5%. The lower FCR and higher values of FI, FER and PER were obtained when fish fed diet contained 1.5 % cinnamon meal levels. Seden *et al*. (2009) reported that the highest feed intake and the best FCR were obtained when fish fed on diet containing 1% of *Origanum vulgar*.

Table (5) revealed that the incorporation of FLSM in growing Nile tilapia diets released no significant effect on whole fish bodies contents of dry matter, protein, lipids and ash compared to the control. These results agree with those found by Abd El- Wahab *et al.* (2007) and Ahmad *et al.* (2009) who found no significant differences in moisture, crude protein, of Nile tilapia fed diets containing various levels of cinnamon seed meal.

Table (5): Proximate chemical analysis (% on dry matter basis) of Nile tilapia whole body fed diets containing different levels of fennel seeds meal (FLSM) for 14 weeks.

Items	(Control) 0.0%	FSM levels		
		1%	2 %	3 %
Moisture	75.36 ±٠.٤٨ [a]	75.05±٠.٤٨ [a]	76.05±٠.٤٨ [a]	75.70±٠.٤٨ [a]
Crude protein	57.76 ±٠.٤٨ [a]	57.91± ٠.٤٨ [a]	58.06±٠.٤٨ [a]	58.17±٠.٤٨ [a]
Total lipids	23.33 ±0.49 [a]	23.20 ±0.49 [a]	22.14 ±0.49 [a]	23.58 ±0.49 [a]
Ash	18.55 ±٠.٤٨ [a]	17.85 ±٠.٤٨ [a]	18.70 ±٠.٤٨ [a]	18.02 ±٠.٤٨ [a]

Means the same letter in the same row is not significantly different at ($P<0.05$).

As presented in Table (6), results show that the incorporation of FLSM increase the price of one kg. diet and the increase in diet price was more pronounced at higher incorporation levels compared to the control group. Average costs to produce on kg. gain in weight for the control; 1% FLSM 1, 2% FLSM and 3% FLSM groups were 6.57, 5.47, 5.59 and 6.03 LE., respectively. Results of the same table show that incorporation of one kg. gain in weight by 16.36; 14.92; and 8.22 % for the 1% FLSM, 2% FLSM and FLSM 3 % groups compared to the control group, respectively. These

results may in indicate that a level of 1% % FLSM in growing Nile tilapia diets is the optimum incorporation level for enhancing the growth and nutrients utilization performance and consequently resulted in the highest reduction in feed costs to produce one Kg gain in weight. Previous studies showed that the use of spices in small amounts gave lower incidence cost and higher profit index for different fish species (Abd-Elmonem *et al.,* 2002; Sakr, 2003; Shalaby *et al.,* 2004; El-Dakar *et al.,* 2004; Ahmad *et al.,* 2009 and Seden *et al* 2009).

Table (6): Economic efficiency for production of one Kg gain of Nile tilapia fed diets containing different levels of fennel seeds meal (FLSM) for 14 weeks.

Items	Control 0.0%	FLSM levels		
		1 %	2 %	3 %
Price/ kg feed P.T	2.67	2.71	2.74	2.78
FCR (kg feed/kg gain)	2.46	2.02	2.04	2.17
Feed cost / kg gain P.T	6.57	5.47	5.59	6.03
Reduction cost in kg	100	16.36	14.92	8.22

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استجابة أسماك البلطى النيلى لمستويات مختلفة من مسحوق بذور الشمر فى العليقه

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أجريت هذه الدراسة لمعرفة تأثير مستويات مختلفة من مسحوق بذورالشمر كإضافات غذائية على أداء النمو والكفاءة الغذائية لأسماك البلطى النيلى (وزن البداية ٤.٥ حم/ السمكة) ومقارنة ذلك بالكنترول واجريت هذة الدراسة فى عدد ١٢ حوض زجاجى (60 x 40 x 50) لأربعة معاملات بمستويات إضافة صفر، ١ ، ٢ ، ٣ % من مسحوق بذور الشمر وكل معاملة مكونة من ثلآثة مكررات وكانت جميع العلائق متساوية فى محتواها من البروتين والطاقة (٣٠.٦٤% بروتين خام ، ٤.٧٣ كيلو كالورى/جم عليقة). وكان معدل التغذية ٣ % من وزن الجسم الحى وقسمت الوجبة الى ثلاثة كميات متساوية وقدمت على ثلاثة فترات (الثامنة صباحا والثانية عشر ظهرا والثالثة مساءا) وكانت التغذية ٦ أيام / الأسبوع لمدة ١٤ أسبوع وكان يتم وزن الأسماك كل أسبوعين ويتم تغيير كمية العلف طبقا لوزن الأسماك الجديد وكان عدد الأسماك فى كل حوض (مكرر) ٢٠ سمكة وكن يتم تنظيف الأحواض يوميا من مخلفات الأسماك بتغيير كمية من الماء الخالى من الكلور بعمل السيفون.

أشارت النتائج إلى أن أعلى معدل لوزن الأسماك ومعدل الوزن النسبى للمجموعة التى تغذت عليقة بها١ % من مسحوق بذور الشمر ثم تلتها العليقة التى بها ٢ % من مسحوق بذوز الشمر ثم العليق التى بها ٣ % من مسحوق بذور الشمر بفروق معنوية. كما سجلت المعاملات التى إحتوت على الشمر أعلى قيم لمعامل الإستفادة الغذائية عند المقارنة بالمجموعة الضابطة (الكنترول). وكان أفضل معامل تحويل غذائى (أقل) للأسماك التى تغذت على عليقة بها ١% ، ٢ % من مسحوق بذور الشمر. كما لم يتأثر التركيب الكيماوى لجسم الأسماك فى نهاية التجربة بمستويات الإضافة المختلفة من مسحوق بذور الشمر. وأدى إضافة مسحوق بذور الشمر بمستويات مختلفة ١، ٢ ، ٣ % الى خفض تكاليف إنتاج ١ كجم وزن حى من الأسماك ب ٣٦.٣٦، ١٤.٩٢، ٨.٢٢ % بالمقارنة بالمجموعة الضابطة (الكنترول).

وتوصى هذه الدراسة: بأن المستوى الامثل لإضافة مسحوق بذور الشمر فى علائق أسماك البلطي النيلى هي ١% وذلك لتحسين النمو ورفع معدل الاستفادة من العلف وكذلك خفض التكلفة الإقتصادية لإنتاج ١ كجم وزن حى من الأسماك بنسبة ١٤.٩٢ %.