Influence of Feeding Frequency and Two Feed Forms (Pressed and Extruded) Diets on Growth Performance, Nutrients Utilization and Whole Body Composition of Monosex Nile Tilapia Fry During Nursing Period

Essa, M.A.[1], Omar,[2] E. A., Srour[2], T. M., Aly[1], H. A., Abd Elaty[1], B.S., and Habiba,[1] M.M.

1. Aquaculture Division, National Institute of Oceanography and Fisheries, Egypt
2. Animal and Fish Production Dept., Fac .Agriculture (Saba Basha), Alexandria Univ., Egypt

ABSTRACT :An experiment was conducted to investigate the influence of feeding frequency (two and three times) and two feed forms (pressed and extruded diets) on growth performance, nutrients utilization and whole body composition of monosex Nile tilapia, *Oreochromis niloticus*, fry during nursing period. Eight glass aquaria were used as culture units .Two aquarium per treatment were used. 320 Nile tilapia fry were randomly distributed among 8 cages at the rate of 40 fry/ aquarium. A 2x2 factorial design, including two feeding frequencies (2 and 3 times per day) and two feed forms (extruded or pressed pellets) has been adopted. Duplicate groups of Nile tilapia fry with an average initial weight of 0.20 g, were fed a 32% protein diet, in extruded or pressed form, at a daily rate of 10% of the total fish biomass. Results indicated that growth performance and feed utilization efficiency of Nile tilapia fry significantly increased when they were fed on extruded pellets compared with the fry fed on pressed pellets. The highest values were obtained when the extruded pellets diet was fed three times daily. From the foregoing performance results, it could be concluded that the feeding Nile tilapia fry 3 times daily with extruded diet improved growth performance, feed utilization and whole body chemical analysis.

Key words: Nile tilapia, *Oreochromis niloticus*, feeding frequency, extruded and pressed pellets, growth performance body composition.

INTRODUCTION

Nile tilapia, (*Oreochromis niloticus)*, constitute a major and important fish in the Egyptian aquaculture, that's where tilapia production reached 557049 tons in 2011 and represents about 60.6% of the total production of fish farms (GAFRD, 2012). This is due to the Nile tilapia is characterized by significant economic characteristics: easily spawned, use a wide variety of natural and artificial foods, resistance to diseases, tolerate poor water quality, grow rapidly and produce a highly acceptable flesh for Egyptian consumers (El-Sayed, 2006;Abd Elaty,2012; Refaey, 2013 and Essa *et al.,*2013). Fish rearing and feeding are of the most important factors in commercial fish farming because feeding quality and regime may have consequences on both growth efficiency and maintain the water quality in fish ponds (Lanari *et al*., 1995; and Ammar *et al*., 2008).In recent years, processing techniques used to produce commercial diets for use in aquaculture have widely increased. This increase has been driven by the fast development of aquaculture, which has resulted in an increased demand for high quality diets designed to meet nutritional requirements of fish (Bud *et al*., 2009; Jafaryan *et al*., 2011).The processing techniques including grinding, steam conditioning and extrusion are common in the production of pellet diets in aquaculture and their use often facilitates

improvement in the raw products. These diets have superior water stability, better floating properties and a higher energy than pressed pelleted diets (Guroy, 2006 and Ammar, 2008). Feed expense is the highest share of total cost in any intensive aquaculture operations. Therefore, feed quality and feeding strategy are of great importance in fish nutrition science. Therefore, the present study aims to investigate the influence of feeding frequency and feed forms (extruded and pressed pellets) on growth performance, nutrients utilization and body chemical composition of monosex (male) Nile tilapia fry, during nursing period.

MATERIALS AND METHODS

The present study was carried out at the Aquaculture Laboratory, El-Max Research Station, National Institute of Oceanography and Fisheries, Alexandria (NIOF) in order to evaluate the influence of feeding frequency and feed forms (extruded and pressed pellets) on growth performance, nutrients utilization and carcass composition of monosex (male) Nile tilapia fry, during nursing period.

Experimental System and animals: Eight glass aquaria with dimensions of (30×70×40cm) were used .Each gives a water volume of 80 liters. Each aquarium was supplied whit automatic heaters to maintain the water temperature between 22:26°C, air pump and stone to provide continuous aeration to water where water dissolved oxygen was 5.2 - 6.5 mg /L. Water pH was in the range of 7.8 - 8.1 during the experimental period.

Feeding regime : Each diet was fed to randomly assigned duplicate aquaria where each aquarium was stocked with 40 fry with an average 0.20g.Afixed feeding regime 10 % of body weight per day (dry food /whole fish) was employed and fish fed two or three times daily in equal proportions. Feeding was performed for six consecutive days with no food being given on the seventh day when the fish were weighed**.** The necessary adjustment in quantity of food intake was carried out the end of every weighing period. Fish were observed during the feed times.

Experimental diets: Two diets were formulated (pressed and extruded) were purchased from NIOF research semi – commercial feed Milling EL Max research station, Alex.

Table 1. Composition (%), and chemical analysis (%) and gross energy of the experimental diets

Ingredient	Extruded diet	Pressed diet
Fish meal (70% - Danish)	5.0	5.0
Fish meal (62% - Vietnam)	5.0	5.0
Soybean (45-solv VN)	36.0	36.0
Corn (9% CP)	12.0	12.0
Rice (polished)	10.0	10.0
Gluten (corn60%)	7.0	7.0
Wheat bran	10.0	10.0
Wheat (14 CP)	10.0	10.0
Corn/wheat starch	3.5	3.5
Dicalcium Phosphate	1.0	1.0
Vitamins and mineral	0.30	0.30
Fish oil	0.2	0.2
Chemical analysis (%)		
Dry matter (DM)	93.95	93.4
Crud protein (CP)	32.11	32.10
Ether extract (E.E)	3.41	3.25
Ash	5.47	5.94
Crude fiber (CF)	2.99	2.82
Nitrogen free extract (NFE)	56.02	55.89
Gross energy(kcal/100g) (GE)*	444.44	442.34
P/E ratio (mg CP/kcal)	72.25	72.57

* GE= Gross energy based on 5.65 kcal/g for protein 9.45 kcal/g for Fat, 4.12 k cal/g for Carbohydrate, Jauncey, K. and Ross B. (1982).

Analytical methods: An initial sample of fish, 2 per aquarium was killed prior the start of the experiment and subjected to proximate analysis**.** A final sample of 3 fry per aquarium was treated and fish diets similarly (AOAC, 1989).

Growth and nutrition of parameters measured:

1. Weight gain (WG)= final weight-initial weight
2. Specific growth rate (SGR %)
   SGR = (Lnw2 – Lnw1) ×100 /t
   Where w2 final mean weight of fish in grams
   W1 initial mean weight of fish in grams
   t Experimental period in days .
3. Food conversion ratio (FCR)
   This was computed from the following.
   FCR = Food consumed (g) / total wet weight gain

4. Protein efficiency rates (PER)
   PER = Total wet weight gain (g) / Amount of protein fed (g)
5. Protein productive value (PPV)
   PPV (%) =(Retained protein (g) /protein intake (g))×100
6. Energy gain (Kcal) (EG)
   Energy gain = Et- E0
   Where:
   E0: energy content in fish carcass (Kcal) at the start
   Et: energy content in fish carcass (Kcal) at the end
7. Energy utilization (EU %):
   EU % = 100 × [(Et- E0)/ Energy intake (Kcal)]

Statistical analysis: Factorial analysis (2×2) of the experimental result was conducted according to SPSS (version 16.00). Duncan's multiple range tests Duncan's (1955) were carried out to test the significance level among means of treatments.

RESULTS AND DISCUSSION

1-Chamical analysis of Experimental diets: The data of experimental diet chemical analysis are presented in Table (1). Dry matter values were 93.95% in extruded diet, while it was 93.4% in pressed diet. Concerning the crude protein content, it was 32.11 and 32.10% in extruded and pressed diets, respectively. Also ether extract% was higher in extruded diet (3.41) than in pressed diet (3.25), while the Ash % was 2.99 and 2.82 in extruded and pressed diets, respectively. Nitrogen free extract were 56.02% and 55.89% in extruded and pressed diets, respectively.

2-Growth performance and survival rate: The Initial body weight (IBW), final body weight (FBW), Body weight gain (BWG), Average daily gain(ADG), Specific growth rate(SGR%/day), and survival of fish fed the experimental diets are shown in Table (2). All groups had similar initial weight, but the final weights among treatments were statistically different (P≤ 0.01).

Analysis of variance for the present results indicated that the fish fed extruded diet had significantly higher body weight (5.08 and 4.89 g for three and two times daily, respectively)compared to those fed on the pressed diet (3.47 and 3.15g for three and two times daily, respectively). Also the results showed that FBW increased with increasing the feeding frequency in both extruded and pressed diets. Significant differences were observed in BWG, ADG and SGR due to the diet form and feeding frequency, where the highest values were recorded in fish fed extruded diet three times/day (4.88 g, 0.061 g/day and 4.12 %/day, respectively) followed by fish fed on extruded diet two times/day (4.69g, 0.060 g/day and 4.02%, respectively). While, fish fed on pressed diet two times /day had the lowest values (2.95g, 0.040 g/day and 3.48%, respectively). These results showed that extruded diet and feeding three times/day significantly improved the growth performance of monosex Nile tilapia fry during the experimental period.

Table 2. Influence of feeding frequency and two formed (extruded and pressed) diets on growth performance and survival rate (%) of monosex Nile Tilapia fry, during nursing period

Feed forms	Feeding frequency time/daily	Body weight			Average		
		Initial (g/fis)	Final (g/fis)	Gain (g fish/day)	ADG (g/day)	SGR (%/day)	Survival rate (%)
Extruded	2	0.20 ±0.01	4.89 ±0.60	4.69[a] ±0.59	0.060[a] ±0.01	4.02[a] ±0.13	83.75 ±6.25
	3	0.20 ±0.01	5.08[a] ±0.62	4.88[a] ±0.61	0.061[a] ±0.01	4.12[a] ±0.11	84.10 ±6.24
Pressed	2	0.20 ±0.01	3.15[b] ±0.02	2.95[c] ±0.03	0.040[b] ±0.00	3.48[b] ±0.04	83.75 ±1.25
	3	0.20 ±0.01	3.47[b] ±0.37	3.28[b] ±0.37	0.040[b] ±0.00	3.61[b] ±0.16	82.50 ±5.00

*only means with different superscript letters are in each column significantly different (P≤0.01)

These results are in accordance with those reported by Lee *et al.*(2000) who reported that, a better growth and feed efficiency in 3.5 g flounder, paralichthys olivaceus, fed to satiety was obtained at a feeding frequency of 2 or 3 times daily than once. Also, Ammar *et al.*(2008) showed that FBW of Nile tilapia and mullet after 20 weeks were higher in fish fed extruded diet. Similar results were also observed in other fish species by Ammar (2008) on sea bream and sea bass and Aksnes *et al.* (1997) on sea bass, who observed that FBW and SGR were significantly higher in fish fed extruded diet compared with fish, fed the trash fish. Also, Aba *et al.*(2012) and Hematzade *et al.*(2013) showed that rainbow trout fed on extruded diet had the best FBW, WG, and SGR in compared with fish fed pressed diet. Wassef and Eisawy (1985); Aksnes *et al.* (1997); Deguara (1997); showed that extruded diet of sea bream increased significantly the body weight and growth rate .Guroy (2006) and Chebbaki (2010) in their work on *Dicentrarchus labrax*, even with isoenergetic diets for pressed and extruded diets have observed a better performance in terms of weight when fish were fed extruded diets. Concerning the feeding frequency, in their investigation on Nile tilapia, Sanches and Hayashi (2001) reported that FBW increased with increasing the feeding times/day. Also, Yousif (2002) observed that, minimum FBW recorded was in the 2 times/day feeding frequency and the maximum was observed in fish fed 3 or 4 times/day.

Significant differences were not observed in final fish survival rates during the feeding period with two diets and two feeding frequencies (values were ranged from82.50% to 84.75%, Table 2), although a highest survival rate (84.75%) was obtained at a Nile tilapia fry fed extruded diet three times daily. These results

are in agreement with Sanches and Hayashi (2001) who found that Nile tilapia fry survival rate was not significantly affected by feeding frequency.

1- Nutrients utilization

Results of feed intake (FI), feed conversion ratio (FCR), Protein Efficiency ratio (PER), Protein productive value (PPV), Energy gain (EG) and Energy utilization (EU) are presented in Table (3). These values were influenced by different form diets and feeding frequency, while the pressed diet and two daily feeding frequencies provided lower values compared with the extruded diet and three times daily feeding frequency. Concerning FI and FCR, the fish fed extruded diet at two and three times daily presented a significantly ($P \leq 0.01$) higher feed intake (FI) (10.84 and 11.38g/fish, respectively) than those fed pressed diet at two and three times daily (7.60±0.22 and 8.45±0.17g/ fish, respectively). FCR did not reveal significant differences in terms of feeding regime, although Nile tilapia fry fed extruded diet at three times daily used less feed (2.33) to produced one unit of weight gain. The techniques of processing may have effect on feed consumption as well as digestibility of the feed content. Feed consumption was clearly affected by diet processing as the best FCR was found in fish fed the extruded pellet. Fish fed the floating extruded diet consumed significantly less ($P \leq 0.01$) on a biomass basis than fish fed the pressed pellet. These results similar to those observed by Ammar (2008) who reported that the best FCR was obtained by fish fed extruded diet. Also, similar trends were obtained by some authors on different fish species, Ammar *et al.*(2008) on Sea Bass and Sea Bream, Aba *et al.*(2012) and Hematzade *et al.*(2013) on rainbow trout.

As a consequence of these growth results, PPV was significantly ($P \leq 0.01$) higher in fish fed extruded diet three and two times daily (25.23and 22.94%, respectively) than those in fish fed pressed diet three and two times /day(22.76 and 19.42, respectively). Also, in case of the feeding frequency, the fish fed three times daily showed significant enhancement in PPV than fish fed two times daily. The best PER were obtained from the fish fed on extruded diet with feeding frequency three times daily (1.37 and 1.35, respectively) but there was no significant differences compared with the other treatments. These findings are in agreement with the findings of Venou *et al.* (2003), who reported that extrusion improved significantly all apparent digestibility coefficients, and Andrew *et al.* (2004) who reported that softer pellets increased consumption and reduced waste from handling.

Similar trend was observed in the results of EG and EU which were significantly higher in fish fed extruded diet (6.90and 6.00Kcal for EG and 14.01and 12.51% for EU, respectively) compared with fish fed on pressed diet (4.47and 3.53Kcal for EG and 12.00and 10.52% for EU, respectively).

Table 3. Influence of feeding frequency and two formed (extruded and pressed diets) on feed utilization parameters of monosex Nile Tilapia fry during nursing period

Feed forms	Feeding frequency time/daily	Feed intake (g/fish)	FCR	PER	PPV (%)	Energy Gain (kcal)	Energy Utilization (%)
Extruded	2	10.84^{b} ±1.01	2.34 ±0.01	1.35^{a} ±0.00	22.94^{b} ±0.21	6.00^{a} ±0.40	12.51^{b} ±0.33
	3	11.38^{a} ±1.04	2.33 ±0.01	1.37^{a} ±0.01	25.23^{a} ±0.32	6.90^{a} ±0.51	14.01±0.31
Pressed	2	7.60^{c} ±0.22	2.59 ±0.09	1.21^{b} ±0.04	19.42^{c} ±0.78	3.53^{c} ±0.01	10.52^{c}±0.26
	3	8.45^{c} ±0.17	2.57 ±0.15	1.21^{b} ±0.07	22.76^{b} ±1.72	4.47^{b} ±0.11	12.00^{b}±0.53

*Only means with different superscript letters in each column are significantly different (P≤0.01)

2- Whole body chemical composition

Whole-body proximate composition of the mono sex Nile tilapia fingerlings are given in Table 4. No significant (P ≤0.01) differences in any of the proximate components were detected. However, crude protein and ether extract of whole-body fish fed extruded diets three times daily (68.90and 13.29%, respectively) was the highest value compared with the other treatments. On the other hand, the highest ash content was presented by fish fed on pressed diet two times daily (22.4%).According to the present results in Table (4), feeding Nile tilapia fry 3 times daily with extruded diet improved whole Body composition in fingerlings by increasing the protein content and reduce the ratios of fat and ash. Same trend was observed by Aba *et al.*(2012) when they found that rainbow trout bodies which fed on extruded diet had more protein, more fat and less moisture, also, Noesk-Hallin *et al*. (1985)reported that feeding at some times of day conductive to lean body growth and at other times to fattening.

Table 4. Influence of feeding frequency and two formed (extruded and pressed diets) on whole body chemical composition parameters of monosex Nile Tilapia fry, during nursing period

Feed forms	Feeding frequency time/daily	Dry matter (%)	% On dry matter basis			Carcass energy (kcal/100 g)
			Crude protein	Ether extract	Ash	
Extruded	2	25.95 ±0.38	65.06 ±0.61	13.16±1.04	21.78±0.17	491.18 ±3.47
	3	26.11 ±0.36	68.90±0.58	13.29±0.89	17.81±0.20	563.03 ±3.51
Pressed	2	24.47 ±0.38	64.88±0.62	12.71±1.22	22.41±2.09	485.92 ±11.61
	3	24.63 ±0.21	66.09±7.39	13.13±0.29	11.06±12.39	551.51 ±48.63

* Only means with different superscript letters are significantly different (P≤0.01)

CONCLUSION

From the results of the present study we can concluded that ,the manufacturing and processing technique has significant (P ≤0.01)influence on the growth, feed utilization and whole Body composition parameters of monosex Nile Tilapia. The present rearing and feeding trial demonstrated that monosex Nile tilapia fry during nursing period fed an extruded diet and 3 times daily yielded a better growth performance, survival rate, feed efficiency and flash quality compared to fish fed the pressed pelleted diet 2 or 3 times daily.

Acknowledgement:

The authors gratefully acknowledge all staff of fish breeding and rearing lab, NIOF; Alexandria, for their help and supporting during the experiment period. In addition, we would like to thank Mr. Abd Elbaeth Abd Elaty for his understanding and providing the Possibilities and tools needed to make a part of this experiment in his own fish farm.

REFRENCES:

Aba, M., Driss, B., Khadija, E., Mohammed , B. and Aziz, M. (2012). Effects of Pressed and Extruded Foods on Growth Performance and Body Composition of Rainbow Trout (*Oncorhynchus mykiss*). Pakistan Journal of Nutrition, 11 (2): 104-109.

Abd Elaty, B.S.A. (2012). Use of some modern rearing techniques in monosex Nile Tilapia fingerlings production. Ph.D. Thesis, Fac.Agriculture, Kafr-Elsheikh Univ., Egypt.

Aksnes, A., Izquierdo, M- S., Robaina, L,, Vergara, J. M. and Montero, D. (1997). Influence of fish meal quality and feed pellet on growth, feed efficiency and muscle composition in gilthead sea breain *(Sparus aurata).* Aquacult., 153: 251-261.

Ammar, A. A. (2008). Effect of extruded and trash fish diets on growth performance and pond productivity of the sea bream (*Sparus aurata*), the sea bass (*Dicentrarchus labrax*) and the flat head grey mullet (*Mugil cephalus*) reared in polyculture system in earthen ponds. Egypt J. AquatBlol& Fish., Vol. 12.No.I: 43-58.

Ammar, A. A., Abd-Elgawad, A. S. and Salama, A. A. (2008). Effect of extruded and non-extruded fish pellet on growth performance and total production of Nile tilapia and grey mullet fingerlings reared in a polyculture system in earthen ponds. 8th International Symposium on Tilapia in Aquaculture.

AOAC (1989). Official Methods of Analysis of the Association of Official Analytical Chemists, Washington.

Bud I., Boaru M. A., Petrescu-Mag I. V., (2009). Influence of food and age on breeding and reproductive performances in a rainbow trout population. AACL Bioflux, 2(2):239-247.

Chebbaki, K. (2010). Effect of fish meal replacement by protein sources on the extruded and pressed diet of European sea bass juvenile (*Dicentrarchus labrax*).Agric.Biol. J. North America, 1:704-710.

Cheng, Z. J., Hardy R. W. (2003): Effects of extrusion processing of feed ingredients on apparent digestibility coefficients of nutrients for rainbow trout (*Oncorhynchus mykiss*). Aquac.Nutr. 9(2):77-83.

Deguara, S. (1997). Evaluation of different pressed and extruded fish meal based diets on the growth of gilthead seabream,(*Sparus aurata*L). in: Tacon, A., Barusco, B. (Eds.)* Feeding Tomorrow's Fish, Vol. 22. Cashiers Options Mediterranean, Institut Agronomique Mediterranean de Zaragoza, Spain, pp. 123-139.

Duncan, D. B. (1955). Multiple ranges and multiple F test. Biometric, 11:1-42.

El-Sayed, A.F.M.(2006). Tilapia Culture: Textbook. CABI Publishing is a Division of CAB International, Cambridge, USA, (ISBN-13: 978 – 0-85199-014-9).

Essa, M.A., Goda, A.M., Diallo, A. and Diadhiou, H. (2013). Improved management and technological innovation in African tilapia farms and hatcheries. 2. Activities and Estimated Results.Egyptian J. Nutrition and Feeds, 16 (2): Special Issues, 483.

GAFRD (2012). General Authority for Fish Resources Development, Year Book, Statistics of Fish Production. Ministry of Agriculture, Cairo, Egypt.

Guroy, D. (2006). Influence of feeding frequency on feed intake, growth performance and nutrient utilization in European Sea Bass (*Dicentrarchus labrax*) fed pelleted or extruded diets. Turkish J. Vet. Anim. Sci, 30:171-177.

Hematzade, A., Taati, M. M., Raissy, M. (2013). Effects of extrusion of diet on growth parametersof rainbow trout (*Oncorhynchus mykiss*). ABAH Bioflux, Volume 5, Issue 2 p.21-26.

Jafaryan, H. and Taati M. M., Jafarzadeh M.(2011). The enhancement of growth parameters in common carp (*Cyprinus carpio*) larvae using probiotic in rearing tanks and feeding by various *Artemianauplii*. AACL Bioflux 4(4):511-518.

Jauncey, K and Ross B. (1982). A guide to Tilapia feed and feeding. Institue of Aquaculture, University of Stirling, 111pp.

Lanari, D. D., E. Agaro and R. Ballestrazzi. (1995). Dietary N and P levels, effluent water characteristics and performance in rainbow trout. Water Sci. Technol., 31 (10): 157-165.

Lee, S-M., Hwang, U.G., Cho, S.H. (2000). Effects of feeding frequency and dietary moisture content on growth, body composition and gastric evacuation of juvenile Korean rockfish (*Sebastes schlegeli*). Aquaculture, 187: 399-409.

Noesk-Hallin, T. A., Spieler, R.E., Parker, N.C. and Suttle, M.A. (1985). Feeding time differentially affects fattening and growth of channel catfish. J. Nutr., 115: 1228-1232.

Refaey, M.A.H. (2013). Studies on tilapia fish. Ph.D. Thesis, Fac.Agriculture, Mansoura Univ., Egypt.

Sanches, L.E.F. and Hayashi, C. (2001). Effect of feeding frequency on Nile tilapia, (*Oreochromis niloticus*) (L.) fries performance during sex reversal in hapas. Acta Scientiarum, v.23, p.871- 876.

Tsevis, N., S. Klaoudatosand A. Conides . (1992). Food conversion budget in sea bass (*Dicentrarchus labrax*), fingerlings under two different feeding frequency patterns .Aquacult. 101, 293-304.

Venou, B., Alexis, M. N., Fountoulaki, E., Nengas, L, Apostolopoulou, M. and Castritsi-Cathariou, L . (2003). Effect of extrusion of wheat and corn on gilthead sea bream *(Sparus auraia)* growth, nutrient utilization efficiency, rates of gastric evacuation and digestive enzyme activities. Aquacult., 225: 207-223.

Wassef, E. and Eisawy, A. (1985). Food and feeding habits of wild and reared gilthead bream (*Sparus aurata)*L. Cybium, 9: 233-242.

Yousif , O. M. (2002). The effects of stocking density, water exchange rate, feeding frequency and grading on size hierarchy development in juvenile Nile tilapia, (*Oreochromis niloticus)* L. Emir. J. Agric. Sci. ,14: 45 – 53.

الملخص العربي

تأثير عدد مرات التغذية اليومية واثنين من الاعلاف المطبوخة والمضغوطة على معايير النمو والاستفادة الغذائية وتحليل الجسم ليرقات البلطى النيلى وحيدالجنس (ذكور) خلال مرحلة الحضانة

محمد عبد الرازق عيسى[١]– اجلال على عمر[٢]– طارق محمد سرور[٢]– هديرعبد المجيدعلى[١] – باسم سعد عبد العاطى[١] – محمود محمد حبيبة[١]

١- المعهد القومى لعلوم البحار والمصايد – شعبة تربية الاحياء المائية – الاسكندرية

٢- قسم الانتاج الحيوانى والسمكى – كلية الزراعة (سابا باشا) – جامعة الاسكندرية

تم خلال الدراسة الحالية اجراء تجربة لمدة ٨٠ يوم بمحطة بحوث المكس التابعة للمعهد القومي لعلوم البحار والمصايد– فرع الأسكندرية بغرض دراسة تأثير عدد مرات التغذية اليومية وكذلك نوعان من الأعلاف السمكية (المطبوخة و المضغوطة)، على معايير النمو والاستفادة الغذائية والتركيب الكيماوى لزريعة أسماك البلطى النيلى وحيد الجنس خلال فترة التحضين. وقد تم تصميم تجربة ٢× ٢تتضمن عدد مرات التغذية (٢ و ٣ مرات في اليوم الواحد) ونوعان من الأعلاف الجافة (مطبوخ ومضغوط) . وقد شملت كل معاملة على مكررتين وكان متوسط وزن زريعة البلطي النيلي ٠.٢٠ جرام فى البداية حيث تم تغذيتها على عليقة تحتوي على ٣٢ ٪ بروتين ، بمعدل يومي قدره ١٠٪ من إجمالي الوزن الحي للأسماك. وأشارت النتائج إلى أن الأسماك التي كانت تتغذى على علائق مطبوخة أظهرت زيادة معنوية في معدلات النمو و كفاءة استخدام الأعلاف مقارنة بالأسماك التي كانت تتغذى على علائق مضغوطة و تمالحصول على افضل القيم عند تغذية الاسماك على علف مطبوخ بمعدل ثلاث مرات يوميا. وقد لوحظ أيضا في الأسماك التي غذيت على علف مضغوط بمعدل ثلاث مرات يوميا. كما أظهرت النتائج تحسن في تحليل جسم السمك عند التغذية على علف مطبوخ بمعدل ثلاث مرات يومياً من خلال زيادة محتوى البروتين وتقليل نسب الدهون و الرماد.ويمكن الاستنتاج أن تقنية تصنيع الاعلاف السمكية لها تأثير معنوى على النمو، والاستفادة الغذائية فى اسماك البلطى النيلى وحيد الجنس خلال مرحلة الحضانة وأن استخدام العلف المطبوخ عند معدل تغذية إلى ثلاث مرات يومياً ادى الى تحسين أداء النمو، ومعايير الاستفادة الغذائية ومحتوى البروتين في اصبعيات البلطى.