Comparative Profit and Adoption of Maggot Feed by Catfish Farmers for Production

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Abstract: Due to the very high cost of Fish feed, Fish Farmers in Port Harcourt, Nigerian are resorting to using black soldier fly larvae (*Hermetia illucens L*.), popularly called maggot to supplement the commercial fish feed. This study, using the quasi-experimental research design, anchored on the innovative theory of profit, evaluated the profit potential of using maggot feed only, as against using commercial feed in fish farming. Using a randomize sampling, field trial of catfish feeding was conducted with a total of 156 catfishes divided into six (6) groups: commercial feed group in three replicates and black soldier fly larvae (BSFL/maggot) feed group also in three replicates. Each tank held 26 catfishes and contained 500-700 liters of water. In the three trials of catfish fed with commercial feed of total of 78, about 73% or 57 out of 78 grew from an average weight of 780g to reached over 1kg (1000g) over a 90-day period. About 45% of those fed with BSFL or 35 out of 78 grew from 780g to reach over 1kg (1000g). An average of 36kg of commercial feed were consumed by each of three groups of catfishes with commercial feeds at a cost of ₦1,333 per kg, resulting in total cost ₦47,988 for each of these three groups of commercially fed fishes. On the other hand, an average of 45kg of BSFL were consumed by each of the three catfish groups at the cost of ₦550 per kg, resulting in total cost of ₦24,750 per group. Mean selling price of fish fed with commercial feed ranged from ₦3,717 to ₦3,897 with total profit ranged of ₦48,672 to ₦53,352. On the other and the mean selling price of catfish fed with BSFL ranged from ₦ 2,943 to ₦ 2,950 while its total profit ranged from ₦54,042 to ₦54,774. The study concluded that the African catfish *(Claria Gariepinus)* could be farmed profitably with the Maggot/BSFL meal only. It is thus recommended that farmers could use 100% BSFL feed to grow their catfish from 780g to table size of 1kg and still make reasonable profit.

Keywords: Black Soldier Fly Larvae (BSFL), African Catfish, Cost, Profit, Commercial Feed.

I. INTRODUCTION

Catfish (*Claria Gariepinus*) is the fastest growing species of locally grown and traded fish in Nigeria and even in the Africa continent [1]. This species is considered one of the best for aquaculture as it thrives and grows well in different environments. It can eat both natural and artificial food, making it easy to rear in captivity. It can be raised in various systems like ponds, cages, tanks, and water recycling systems, using either intensive or extensive methods. Catfish grows quickly and can be cross-bred to improve traits like body shape, resilience, reproductive rates, fry survival, and ability to use extra feed [2]. The species are usually grown to a marketable size within 4 to 9 months, depending on the production method used [3]. Most fish farmers venture into the business as a result of it triple marketing value over tilapia. [4]. One major hurdle in catfish farming is the cost of commercial feed. Feed expenses represent the highest operating cost, and it is crucial to provide nutritious feed that promotes rapid growth and efficient feed use, while maintaining water quality [3]. In Nigeria, over 60% of the cost of producing catfish go into feeding, mainly due to high cost of imported/commercial feed. Fortunately, the country has various natural resources that could safely and economically supplement the expensive imported commercial feeds, providing alternative viable solution [5]. Reports have shown that Nigeria can replace fish imports with local production, which would create jobs, reduce poverty in the rural and peri-urban areas, and help improve the balance of payments [5]. Feed is the most expensive component of intensive fish farming [4,6], which affect the profit for most fish farmers. However, one key ingredient that can be incorporated as fish feed component to improve farmers growth, quality and ultimately profit is the black soldier fly larvae (BSFL/maggot). When processed into the defatted state, BSFL/maggot has been shown to contain 60% protein and 10-12% lipids [7]. In its full-fat form, BSFL has 42% crude protein and 30% lipids. BSFL turns waste into valuable biomass that is high in protein and fat [7]. In Indonesia, feed costs account for 60% of production

International Journal of Innovative Science and Research Technology

expenses. As a result, the use of BSFL in animal feed has increased [8]. This shift has boosted the earnings of livestock farmers and improved profits in the catfish industry [9]. BSFL have also in addition been used alternative feed [10]. In the light of the above, this study set out to evaluate the profitability profile of using black soldier fly larvae (*Hermetia illucens L.*) as feed component for Catfish (*Clarias gariepinus*) production in Port Harcourt; Nigeria. The study objectives were to determine the profit based on the weight, length and the selling price of the catfish groups fed with the commercial feed as against those fed with BSFL/Maggot.

II. LITERATURE REVIEW

This section showed that researches have been carried out on the profitability of catfish production in Nigeria. In reviewing the socioeconomic and profitability analysis of catfish production in Enugu, within a 7month production cycle, the total cost of production was estimated to be ₦584,968.041 while the total revenue earned from the sale of market size catfish was ₦2,257,098 implying a profit of ₦1,672,129.96 [11]. In reviewing the economic efficiency and profitability analysis of catfish production in Kaduna State, the gross margin was ₦886,250.51 with a profit of ₦861.021.37 for a production cycle [12]. Similarly in Ibadan, in evaluating factors that determine the profitability of catfish production, the gross margin was ₦197,520.25 with a profit of ₦182,573.04 in a production cycle [13]. In determining the factor profitability of catfish production in Odogbolu local government area of Ogun state, through interview of 120 fish farmers, it was revealed that a total of N3,051,537.50 was spent to realize a total revenue of ₦3,770,291.70 leaving a gross margin of ₦1,216,123.30 and profit of ₦718,754.10. It was further revealed that fish feed accounted for 77.4% of the total cost. [14]. In Ethiope East Local Government Area of Delta State, a study which examined the variables that influence the financial success of fish farming from 60 farmers who responded to the designed questionnaire, revealed the gross margin of $6,407,83 per production cycle and a return on investment of 0.73 [15]. On the other hand, the economics of catfish production in Kaduna revealed a profit of ₦5,282,393.85 rom 9,637 fishes sold at N624.92 per 1.12 kg table fish size [16]. Another study which investigated the constraints to the profitability in the utilization of floating feed for catfish enterprises in Osun State, Nigeria with a sample of 180 catfish farmers, revealed a net income of ₦1,008,769.30 and gross margin of ₦1,039,814.79. Profitability ratios reported was 0.38 indicating that from every ₦1.00 generated from the enterprise, a net income of ₦0.38 was earned [17]. In a related study in Ogun State, Nigeria, the analysis of profitability of fish farming, showed an average total cost of ₦394,380 per annum, earned a gross revenue of N 715,030.30 with a gross margin of N 574,314 and a profit of N320,650. The return on investment of 0.55 implied that for every one Naira invested in Fish production by farmers, a return of ₦1.55 and a profit of ₦0.55 were obtained [18].

In Benue state, Nigeria, a study that examined the profit efficiency among catfish farmers, showed that the cost of feed decreased the profit by 30% [2]. The evaluation of profitability and profit efficiency of catfish fingerlings production in Edo South revealed fish farmers earned a revenue of ₦2,885,443.2 and profit of ₦2,084,004.24 per production cycle 120,000 fishes [18].

Though the above studies in Nigeria did not report BSFL as component of feed, a study in Sangkuriang (Indonesia), catfish cultivation was fed with commercial and non-conventional fee in a ratio of 50:50. The combination of feed reduced costs by IDR 675/kilogram of feed [10].

III. MATERIAL AND METHODS

This study employed quasi-experimental research design by relying on the previous work on catfish feeds [20]. Six (6) groups of catfish were formed from group A of previous work with average weight gain of 780g [21]. Three (3) groups of the catfish were continued with same commercial feed as a continuation while another three (3) were fed with BSFL only. A total of 156 catfish were divided into six (6) groups: commercial feed group in three replicates and BSFL feed group also in three replicates. Each tank held 26 catfishes and contained 500-700 liters of water. The trial lasted 90 days, during which their weights and lengths were recorded every two weeks. SPSS software version 24 was used to analyze the data. The prevailing market price of 1kg of catfish was N3,000. The unit weight of catfish selling price from our study were based on N3 per g of the commercial feed. In determining the profit through budget analysis of the catfish production from both commercial and BSFL feeds, the following modified relations were determined [22]:

Total Revenue (TR) = Price (P) x Quantity (Q)

Total Cost (TC) = Cost of feed + α

Where α = constant (all other cost such as labour, water and electricity were held constant)

IV. RESULTS

Figures 1 to 3 showed the mean weight of commercially fed catfishes and those with BSFL, mean length of commercially fed catfishes and those with BSFL, and mean selling price of commercially fed catfishes and those with BSFL. Table 1 showed the descriptive statistics while Table 2 showed the analysis of variance. Table 3 showed the multiple comparison between the individual member of the one group of trial catfish with another group. Table 4 presented the budget analysis of the catfish fed with commercial and BSFL feeds.
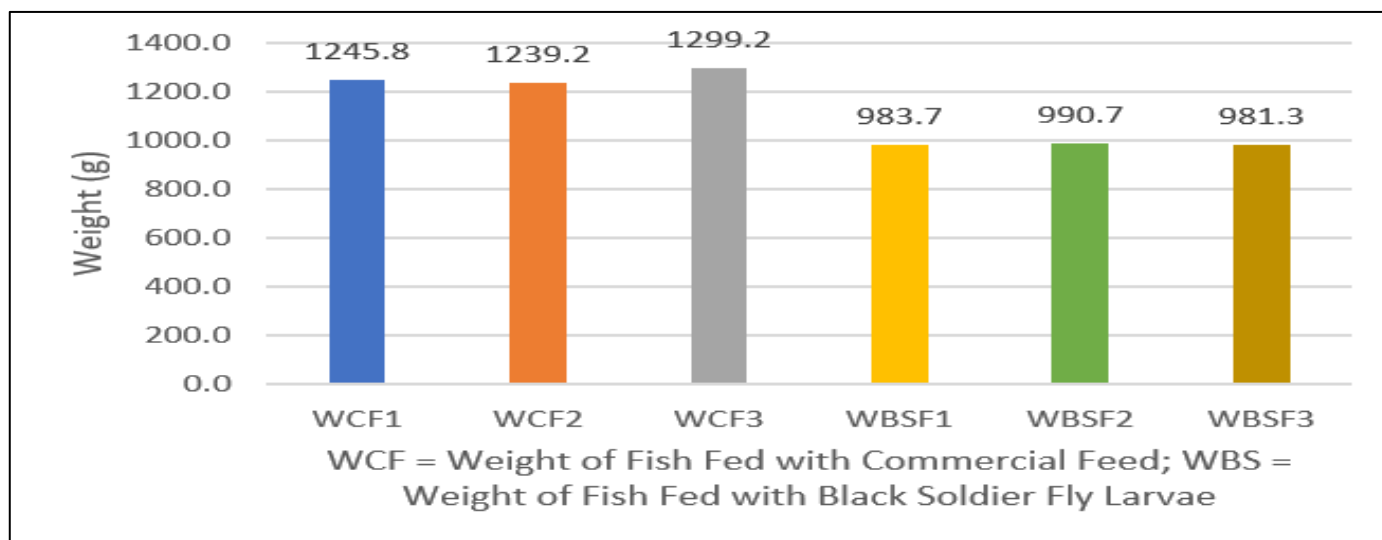
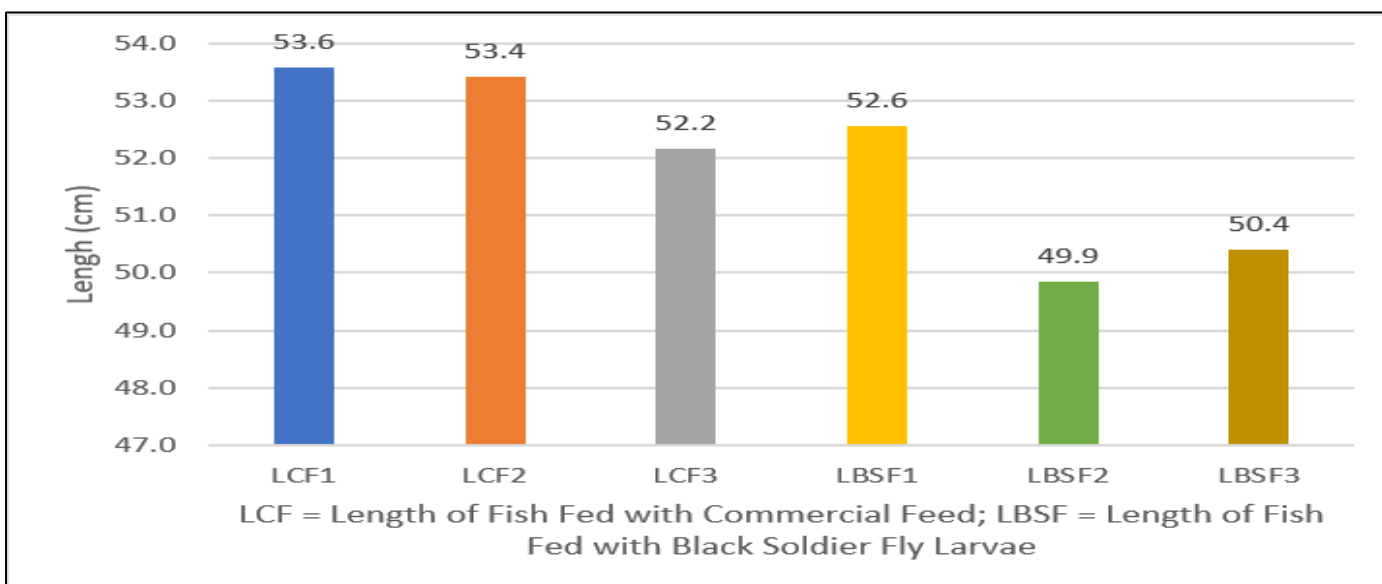Fig 1 Mean Weight of Commercially Fed Catfishes and Those with BSFL

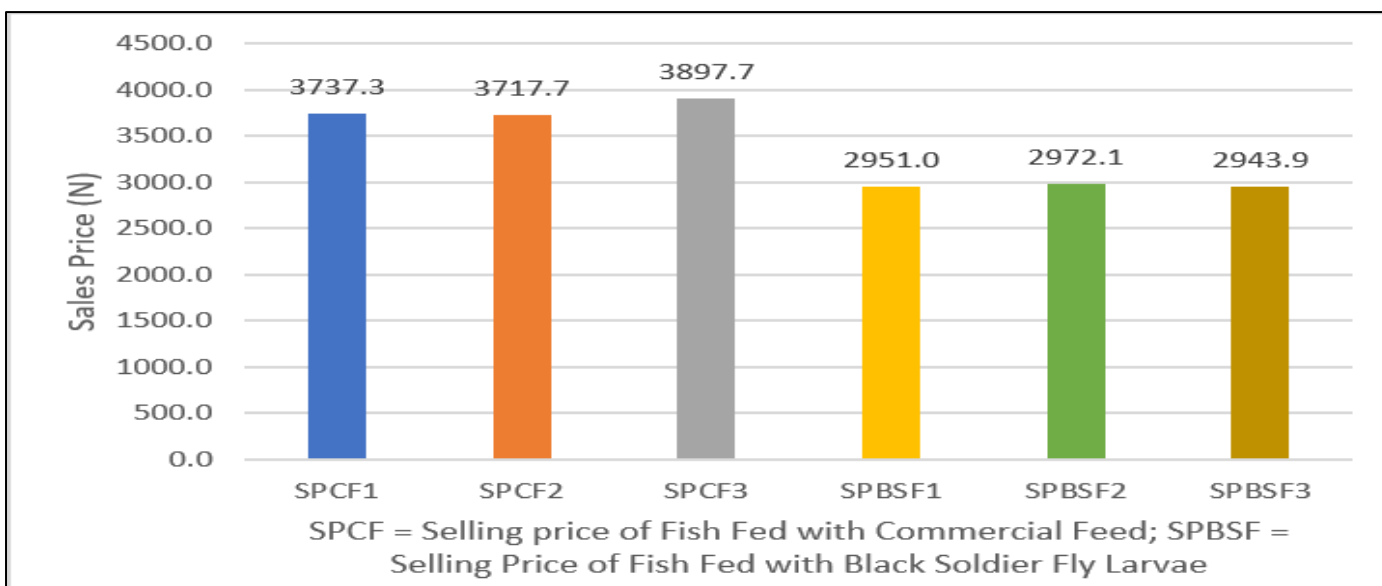Fig 2 Mean Length of Commercially Fed Catfishes and Those with BSFL

Fig 3 Mean Selling Price of Commercially Fed Catfishes and Those with BSFL

Table 1 Descriptive Statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
W_Com_Feed	1.00	26	1245.7692	464.20464	91.03802	1058.2729	1433.2655	565.00	2380.00
	2.00	26	1239.2308	462.62757	90.72873	1052.3715	1426.0901	568.00	2378.00
	3.00	26	1299.2308	431.84046	84.69088	1124.8066	1473.6549	619.00	2185.00
	Total	78	1261.4103	448.02961	50.72936	1160.3952	1362.4253	565.00	2380.00
L_Com_Feed	1.00	26	53.5769	7.22453	1.41685	50.6589	56.4950	39.00	67.00
	2.00	26	53.4192	6.15623	1.20734	50.9327	55.9058	40.00	66.00
	3.00	26	52.1769	5.38028	1.05516	50.0038	54.3501	41.00	61.00
	Total	78	53.0577	6.24873	.70753	51.6488	54.4666	39.00	67.00
Sp_Com_Feed	1.00	26	3737.3077	1392.61391	273.11406	3174.8188	4299.7966	1695.00	7140.00
	2.00	26	3717.6923	1387.88270	272.18619	3157.1144	4278.2703	1704.00	7134.00
	3.00	26	3897.6923	1295.52139	254.07265	3374.4199	4420.9647	1857.00	6555.00
	Total	78	3784.2308	1344.08883	152.18809	3481.1856	4087.2760	1695.00	7140.00
W_Bsf_Feed	1.00	26	983.6538	300.46323	58.92569	862.2941	1105.0136	494.00	1717.00
	2.00	26	990.6923	332.87232	65.28163	856.2423	1125.1423	498.00	1922.00
	3.00	26	981.3077	323.23103	63.39082	850.7519	1111.8635	424.00	1801.00
	Total	78	985.2179	314.99848	35.66655	914.1968	1056.2391	424.00	1922.00
L_Bsf_Feed	1.00	26	52.5577	8.62592	1.69168	49.0736	56.0418	43.00	86.50
	2.00	26	49.8577	5.37402	1.05393	47.6871	52.0283	39.00	62.00
	3.00	26	50.4154	6.41976	1.25902	47.8224	53.0084	39.80	66.00
	Total	78	50.9436	6.94893	.78681	49.3768	52.5103	39.00	86.50
Sp_Bsf_Feed	1.00	26	2950.9615	901.38970	176.77707	2586.8824	3315.0407	1482.00	5151.00
	2.00	26	2972.0769	998.61696	195.84490	2568.7268	3375.4270	1494.00	5766.00
	3.00	26	2943.9231	969.69310	190.17246	2552.2556	3335.5906	1272.00	5403.00
	Total	78	2955.6538	944.99544	106.99966	2742.5903	3168.7174	1272.00	5766.00

W_Com_Feed = Weight of fish fed with commercial feed; L_Com_Feed = Length of fish fed with commercial feed; Sp_Com_Feed = Selling price of fish fed with commercial feed; W_Bsf_Feed = Weight of fish fed with BSFL; L_Bsf_Feed = Length of fish fed with BSFL; Sp_Bsf_Feed = Selling price of fish fed with BSFL

Table 2 ANOVA Result

		Sum of Squares	DF	Mean Square	F	Sig.
W_Com_Feed	Between Groups	56341.026	2	28170.513	.137	.872
	Within Groups	15399909.846	75	205332.131		
	Total	15456250.872	77			
L_Com_Feed	Between Groups	30.578	2	15.289	.385	.682
	Within Groups	2976.013	75	39.680		
	Total	3006.590	77			
Sp_Com_Feed	Between Groups	507069.231	2	253534.615	.137	.872
	Within Groups	138599188.615	75	1847989.182		
	Total	139106257.846	77			
W_Bsf_Feed	Between Groups	1240.333	2	620.167	.006	.994
	Within Groups	7639010.962	75	101853.479		
	Total	7640251.295	77			
L_Bsf_Feed	Between Groups	105.651	2	52.826	1.097	.339
	Within Groups	3612.501	75	48.167		
	Total	3718.152	77			
Sp_Bsf_Feed	Between Groups	11163.000	2	5581.500	.006	.994
	Within Groups	68751098.654	75	916681.315		
	Total	68762261.654	77			

W_Com_Feed = Weight of fish fed with commercial feed; L_Com_Feed = Length of fish fed with commercial feed; Sp_Com_Feed = Selling price of fish fed with commercial feed; W_Bsf_Feed = Weight of fish fed with BSFL; L_Bsf_Feed = Length of fish fed with BSFL; Sp_Bsf_Feed = Selling price of fish fed with BSFL

Table 3 Multiple Comparisons of Bonferroni

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
W_Com_Feed	1.00	2.00	6.53846	125.67728	1.000	-301.2277	314.3046
		3.00	-53.46154	125.67728	1.000	-361.2277	254.3046
	2.00	1.00	-6.53846	125.67728	1.000	-314.3046	301.2277
		3.00	-60.00000	125.67728	1.000	-367.7662	247.7662
	3.00	1.00	53.46154	125.67728	1.000	-254.3046	361.2277
		2.00	60.00000	125.67728	1.000	-247.7662	367.7662
L_Com_Feed	1.00	2.00	.15769	1.74709	1.000	-4.1207	4.4361
		3.00	1.40000	1.74709	1.000	-2.8784	5.6784
	2.00	1.00	-.15769	1.74709	1.000	-4.4361	4.1207
		3.00	1.24231	1.74709	1.000	-3.0361	5.5207
	3.00	1.00	-1.40000	1.74709	1.000	-5.6784	2.8784
		2.00	-1.24231	1.74709	1.000	-5.5207	3.0361
Sp_Com_Feed	1.00	2.00	19.61538	377.03185	1.000	-903.6831	942.9139
		3.00	-160.38462	377.03185	1.000	-1083.6831	762.9139
	2.00	1.00	-19.61538	377.03185	1.000	-942.9139	903.6831
		3.00	-180.00000	377.03185	1.000	-1103.2985	743.2985
	3.00	1.00	160.38462	377.03185	1.000	-762.9139	1083.6831
		2.00	180.00000	377.03185	1.000	-743.2985	1103.2985
W_Bsf_Feed	1.00	2.00	-7.03846	88.51487	1.000	-223.7991	209.7221
		3.00	2.34615	88.51487	1.000	-214.4144	219.1068
	2.00	1.00	7.03846	88.51487	1.000	-209.7221	223.7991
		3.00	9.38462	88.51487	1.000	-207.3760	226.1452
	3.00	1.00	-2.34615	88.51487	1.000	-219.1068	214.4144
		2.00	-9.38462	88.51487	1.000	-226.1452	207.3760
L_Bsf_Feed	1.00	2.00	2.70000	1.92487	.495	-2.0137	7.4137
		3.00	2.14231	1.92487	.808	-2.5714	6.8560
	2.00	1.00	-2.70000	1.92487	.495	-7.4137	2.0137
		3.00	-.55769	1.92487	1.000	-5.2714	4.1560
	3.00	1.00	-2.14231	1.92487	.808	-6.8560	2.5714
		2.00	.55769	1.92487	1.000	-4.1560	5.2714
Sp_Bsf_Feed	1.00	2.00	-21.11538	265.54462	1.000	-671.3972	629.1664
		3.00	7.03846	265.54462	1.000	-643.2433	657.3203
	2.00	1.00	21.11538	265.54462	1.000	-629.1664	671.3972
		3.00	28.15385	265.54462	1.000	-622.1280	678.4357
	3.00	1.00	-7.03846	265.54462	1.000	-657.3203	643.2433
		2.00	-28.15385	265.54462	1.000	-678.4357	622.1280

W_Com_Feed = Weight of fish fed with commercial feed; L_Com_Feed = Length of fish fed with commercial feed; Sp_Com_Feed = Selling price of fish fed with commercial feed; W_Bsf_Feed = Weight of fish fed with BSFL; L_Bsf_Feed = Length of fish fed with BSFL; Sp_Bsf_Feed = Selling price of fish fed with BSFL

Table 4 Analysis of Profit from Two Feeding Regimes

Com Feed			Com Feed			Com Feed			BSFL Feed			BSFL Feed			BSFL Feed		
WCF1	SPCF1	LCF1	WCF2	SPCF2	LCF2	WCF3	SPCF3	LCF3	WBSF1	SPBSF1	LBSF1	WBSF2	SPBSF2	LBSF2	WBSF3	SPBSF3	LBSF3
1909	5727	67	914	2742	50.9	1401	4203	53	571	1713	44	1530	4590	62	799	2397	45
902	2706	51.5	1378	4134	54.7	801	2403	47	1322	3966	53	678	2034	44.5	740	2220	44.5
853	2559	47	1316	3948	52.7	888	2664	48	1520	4560	57	722	2166	47	819	2457	46
1339	4017	59	870	2610	50.1	628	1884	41	945	2835	53	590	1770	41.5	1014	3042	51
1358	4074	55.5	634	1902	47	1039	3117	52	494	1482	43	890	2670	46	1099	3297	52.3

WCF1	SPCF1	LCF1	WCF2	SPCF2	LCF2	WCF3	SPCF3	LCF3	WBSF1	SPBSF1	LBSF1	WBSF2	SPBSF2	LBSF2	WBSF3	SPBSF3	LBSF3
1098	3294	53	1320	3960	53	1107	3321	52.8	712	2136	48	1065	3195	52	1324	3972	54
599	1797	39	2049	6147	64	1311	3933	53	1087	3261	53	998	2994	48	1168	3504	52.8
1398	4194	55	632	1896	47	1403	4209	58	1191	3573	86.5	1501	4503	61	1012	3036	51.4
1630	4890	59	1033	3099	55	1401	4203	58	863	2589	50	745	2235	47	599	1797	66
1007	3021	51	1023	3069	52	2185	6555	61	1159	3477	55	1188	3564	53	1165	3495	53
565	1695	40.5	1174	3522	58	1912	5736	59	850	2550	50	544	1632	48	1478	4434	60
1918	5754	60	2378	7134	66	1240	3720	54	953	2859	53	1183	3549	53.7	865	2595	50.2
1264	3792	53.5	1624	4872	52	1928	5784	58	583	1749	43	498	1494	39	1539	4617	61
1074	3222	55	1327	3981	52	1411	4233	54	1173	3519	58	791	2373	47.2	1133	3399	57.8
754	2262	46	1919	5757	61	1338	4014	53.3	1098	3294	54	1372	4116	52.1	818	2454	46
1191	3573	53	1340	4020	54	1044	3132	51	714	2142	45	942	2826	47	733	2199	44
1328	3984	53.5	594	1782	41	1609	4827	54	1029	3087	53	1198	3594	52.8	924	2772	50
1343	4029	55	1460	4380	59	1298	3894	52	758	2274	47	1199	3597	53	796	2388	47
1045	3135	52	1223	3669	55	1923	5769	56	1402	4206	58	1023	3069	51	709	2127	46.2
1325	3975	52	1333	3999	56	1172	3516	51	1184	3552	56	1011	3033	51	528	1584	40.4
1443	4329	60	1056	3168	50	2022	6066	60.4	734	2202	46	801	2403	48	917	2751	48
639	1917	46.5	805	2415	48	1091	3273	50.1	787	2361	49	711	2133	47	424	1272	39.8
1344	4032	54	1329	3987	56	619	1857	42	765	2295	47	874	2622	48.5	1801	5403	59
631	1893	43	1916	5748	61.5	1376	4128	44	896	2688	49	1922	5766	60	1197	3591	49
2053	6159	65	1005	3015	53	912	2736	48	1717	5151	64	849	2547	47	1193	3579	51.4
2380	7140	67	568	1704	40	721	2163	46	1068	3204	52	933	2799	49	720	2160	45
Selling price	97,170			96,660			101,340			76,725			77,274			76,542	
Cost price	47,988			47,988			47,988			22,500			22,500			22,500	
Profit	49182			48,672			53,352			54,225			54,774			54,042	

WCF1 = Weight of commercial feed 1; SPCF1 = Selling price of commercial feed 1; LCF1 = Length of commercial feed 1; WCF2 = Weight of commercial feed 2; SPCF2 = Selling price of commercial feed 2; LCF2 = Length of commercial feed 2; WCF3 = Weight of commercial feed 3; SPCF3 = Selling price of commercial feed 3; LCF3 = Length of commercial feed 3; WBSF1 = Weight of BSF1; SPBSF1= Selling price of BSF1; LBSF1 = Length of BSF1; WBSF2 = Weight of BSF2; SPBSF2= Selling price of BSF2; LBSF2 = Length of BSF2; WBSF3 = Weight of BSF3; SPBSF3= Selling price of BSF3; LBSF3 = Length of BSF3

V. DISCUSSION

The descriptive statistics showed that the mean weight of fish fed with commercial feed ranged from 1,239g to 1,245g with the maximum weight of 2,380g while the minimum was 565g. On the other hand, mean weight of fish fed with BSFL ranged from 981g to 990g. The mean length of fish fed with commercial feed ranged from 51cm to 53cm with maximum fish length of 67cm and minimum of 61cm. For those fed with BSFL, the mean length of fish ranged from 49cm to 52cm with maximum length of 86cm and minimum of 62cm. The average consumption of 36kg of commercial feed were consumed by each of three trial catfishes. The unit cost i.e. per kg of the commercial feed was ₦1,333, while the total cost per trial was ₦47,988. For catfishes fed with BSFL, the average of 45kg were consumed by each of three catfish groups at the cost of ₦550 per kg, resulting in total cost of ₦24,750 per group. Mean selling price of fish fed with commercial feed ranged from ₦3,717 to ₦3,897 with total profit ranged of ₦48,672 to ₦53,352. The mean selling price of fish with commercial feed ranged from ₦3,717 to ₦3,897 with maximum of ₦7,140 and minimum of ₦6,555. On the other hand, the mean selling price of fish fed with BSFL ranged from ₦2,943 to ₦2,950 with maximum selling price of ₦5,766 and minimum of selling price of ₦5,151.

The F-Statistics of the catfish weight fed with commercial feed (0.137) was greater than that of those fed with BSF (0.006) suggesting higher variation in catfish weight of those fed with commercial feed than those with BSFL feed. In both of these feeds, there were no significant differences relating to weight. However, with respect to length of catfish, the commercially fed type was lower (0.385) than that of those fed with BSFL (1.097), which implied that there were more variability in length of catfish feed BSFL than those fed with commercial feed. In the same vein, there were no significant differences relating to length of catfishes fed with these two sources. Based on the selling price, the F-Statistics of those catfish fed commercial feed were higher (0.137) than those fed with BSFL (0.06), suggesting more variability in selling price of catfish fed with commercial fed. This study found no significant differences with the selling price of both commercially fed catfish and those fed with BSFL.

This study revealed the total selling price of catfish fed with commercial feed based on the weight ranged from ₦96,600 to ₦101,340 with a constant cost of ₦49,182. The total profit from the commercial feed ranged from ₦48,673 to ₦53,352. On the other hand, the catfish fed with BSFL based on their weight revealed the total selling price ranged from ₦76,542 to ₦77,274 while the cost were constant at ₦22,500 resulting in total profit ranged from ₦54,042 to ₦54,774. In a study in Sangkuriang, Indonesia, catfish cultivation was fed with commercial feed and BSFL in a ratio of 50:50. The combination of feed reduced costs by IDR 675/kilogram of feed [10]. The is equivalent of ₦6,958.76.

VI. CONCLUSION AND RECOMMENDATION

In the three trials of catfish fed with commercial feed totalling 78, about 73% or 57 out of the 78 grew from an average weight of 780g to reached over 1kg (1000g) over a 90-day period. About 45% of those fed with BSFL or 35 out of 78 grew from 780g to reach over 1kg (1000g). The mean selling price of fish fed with commercial feed ranged from ₦3,717 to ₦3,897 with total profit ranging from ₦48,672 to ₦53,352. On the other and the mean selling price of catfish fed with BSFL ranged from ₦2,943 to ₦2,950 with its total profit ranging from ₦54,042 to ₦54,774.

It is thus recommended that farmers could use 100% BSFL feed to grow their catfish from 780g to table size of 1kg and still make a reasonable profit.

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