

*Director's
Digest*



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USE OF ANIMAL PROTEIN IN CATFISH FEEDS

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SUMMARY

FISH MEAL SUPPLEMENTED INTO SOYBEAN MEAL-BASED CATFISH FEEDS IS KNOWN TO INCREASE GROWTH RATE. A 9-WK LABORATORY FEEDING EXPERIMENT WAS CONDUCTED WITH 3.5-GRAM (INITIAL WT) CHANNEL CATFISH IN 12-GAL AQUARIA (3 AQUARIA PER TREATMENT) WITH FLOWING ($29 \pm 2^{\circ}\text{C}$) WATER TO EVALUATE REPLACING FISH MEAL WITH MEAT-AND-BONE MEAL, BLOOD MEAL, AND A 60-40 COMBINATION OF MEAT-AND-BONE MEAL AND BLOOD MEAL. MEAT-AND-BONE MEAL INCREASED FISH PRODUCTION OVER THE CONTROL DIET (SOYBEAN-CORN) AT THE SAME RATE AS THE MEAT-AND-BONE: BLOOD MEAL COMBINATION. THIS IMPROVEMENT WAS SIGNIFICANT ($P < 0.05$). BLOOD MEAL ALONE WAS SLIGHTLY INFERIOR TO MEAT-AND-BONE-MEAL OR THE COMBINATION. FISH MEAL WAS SLIGHTLY BUT NOT STATISTICALLY ($P > 0.05$) SUPERIOR TO MEAT-AND-BONE MEAL AND MEAT-BONE: BLOOD MEAL COMBINATION. RESULTS INDICATE THAT MEAT-AND-BONE MEAL OR MEAT-BONE: BLOOD MEAL COMBINATION CAN REPLACE MOST OF FISH MEAL IN SOYBEAN MEAL BASED CATFISH FEEDS.

OBJECTIVE

COMPARE THE VALUE OF SEVERAL ANIMAL BYPRODUCT FEEDSTUFFS IN SOYBEAN MEAL-BASED CATFISH DIETS. CONTROL DIET WILL BE A BASAL SOYBEAN MEAL WITH NO

ANIMAL PROTEIN. THE ANIMAL PROTEIN PRODUCTS EVALUATED WILL BE FISH MEAL, MEAT AND BONE MEAL, BLOOD MEAL, AND A 60:40 COMBINATION OF MEAT AND BONE MEAL:BLOOD MEAL.

EXPERIMENTAL DESIGN

A SOYBEAN MEAL-CORN BASAL DIET WAS SUPPLEMENTED WITH THE ANIMAL BYPRODUCT MEALS AT TWO LEVELS (EQUIVALENT TO 5 AND 10% FISH MEAL) ON AN EQUAL PROTEIN BASIS (TABLE 1). ALL DIETS WERE NUTRITIONALLY ADEQUATE AND NOT DEFICIENT IN ANY AMINO ACID. THE FEEDS WERE TESTED IN 40-LITER REARING TANKS WITH FLOWING WATER, TEMPERATURE CONTROLLED ($29 \pm 1^{\circ}\text{C}$). EACH FEED WAS FED TO TRIPPLICATE TANKS STOCKED WITH 25 3.5-G CHANNEL CATFISH. THE FISH WERE FED FOR 9 WEEKS. FEED WAS OFFERED TWICE DAILY. WEIGHT GAIN, FEED CONSUMPTION, AND COMPOSITION (PROTEIN AND FAT) OF GAIN WERE MEASURED. COMPOSITION OF GAIN WILL BE PRESENTED LATER FOLLOWING CHEMICAL ANALYSIS OF THE FISH.

RESULTS

INITIAL FEED CONSUMPTION IS CONSIDERED AN INDEX OF DIET PALATABILITY. THE DATA, PRESENTED IN THE RESULTS TABLE, SHOWS THE FISH MEAL, MEAT AND BONE MEAL AND MEAT BONE: BLOOD MEAL COMBINATION CAUSED INCREASED CONSUMPTION ABOVE THE CONTROL DIET WHICH CONTAINED NO ANIMAL BYPRODUCT. AN INCREASE IN ANIMAL BYPRODUCT CAUSED INCREASE IN CONSUMPTION. BLOOD MEAL DID NOT PRODUCE AS MUCH INCREASE IN CONSUMPTION OVER THE CONTROL AS THE OTHER ANIMAL FEEDSTUFFS.

THE WEIGHT GAIN DATA SHOWS THAT ADDITION OF FISH MEAL, MEAT AND BONE MEAL, AND THE MEAT BONE:BLOOD MEAL COMBINATION INCREASE FISH GROWTH WHEN ADDED INTO A SOYBEAN MEAL-CORN CATFISH DIET AT EITHER LEVEL. BLOOD MEAL DID NOT IMPROVE GROWTH AT THE LOWEST LEVEL. ALTHOUGH GROWTH FROM THE FISH MEAL DIETS WAS SLIGHTLY HIGHER, THE DIFFERENCE WAS NOT SIGNIFICANT AT $P < 0.05$.

REASON FOR THE DIFFERENCES IN GROWTH MAY BE DUE TO DIFFERENCES IN PALATABILITY.

Diets¹

Diet	No.	FM	MBM	BIM	MBM		Corn	DiCal-P	Other ²	Oil
					BI	SBM				
No animal protein	1	0	0	0	0	62.6	30.26	1.58	5.1	-
Low FM	2	5	0	0	0	55.5	32.86	1.54	5.1	-
Hi FM	3	10	0	0	0	48.4	35.44	1.06	5.1	-
Low MBM	4	0	5.6	0	0	54.0	34.3	1.1	5.1	-
Hi MBM	5	0	11.3	0	0	47.0	36.6	0	5.1	-
Low BIM	6	0	0	3.4	0	53.5	35.9	2.1	5.1	-
Hi BIM	7	0	0	6.8	0	45.5	40.5	2.1	5.1	-
Low Combo	8	0	0	0	5	55.5	32.92	1.48	5.1	-
Hi Combo	9	0	0	0	10	48.4	35.57	.93	5.1	-
No animal protein - oil	10	0	0	0	0	52.6	30.26	2.04	5.1	1.58

¹ Abbreviations = FM = menhaden fish meal, MBM = meat and bone meal, BIM = blood meal, SBM = soybean meal, DiCal-P = dicalcium phosphate, Combo = MBM - BIM.

² Other: complete vitamin mixture, trace mineral mixture, carboxymethyl cellulose (binding agent), 1.5% catfish oil.

Effects of substituting animal protein sources into a
corn-soybean meal (control) catfish diet

Diet	First week feed consumption	Weight gain
	(grams/fish)	(grams)
Control	0.93 a	10.2 a
Fishmeal 5%	1.34 b	14.8 b c
Fishmeal 10%	1.53 b	16.9 b c
Meat-bone meal 5.6%	1.29 b	12.5 b
Meat-bone meal 11.3%	1.57 b	14.4 b c
Blood meal 3.4%	1.16 c	10.4 a
Blood meal 6.8%	1.22 c	13.5 b c
Meat-bone + blood meal 5%	1.40 b	12.1 b
Meat-bone + blood meal 10%	1.67 b	14.7 b c
Control + oil	1.00 a	10.3 a