THE DRESSING PERCENTAGE AS AFFECTED BY DIFFERENT FEED FORMULATIONS ON FOUR AND EIGHT MONTHS RAINBOW TROUT

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Abstract

The objective of this study was to compare the body weight and eviscerated weight and rate of fillet yields from rainbow trout reared for four and eight months and fed a control, a fish meal-based diet or diets where 25, 50, 75 or 100% of the fish meal protein was replaced with an animal by-product mixture. All diet groups of rainbow trout after eight months of rearing increased in body weight, eviscerated weight and length in comparison with fish that were fed for four months. However, the above increases were accompanied by lower percentage fillet yields what brings economical benefit of longer fish rearing into question.

Introduction

The utilization of by-products in feed is often limited by its influence on the sensory quality. The following authors did not find any negative effects on quality and/or sensory scores of: pork carcasses when poultry (Tibbets, 1987) and fish (Tibbets, 1981) offal silage comprised up to 20% of the diet was fed; pork roast when poultry offal hydrolysate was fed at 15% (Van Lunen, 1990) or 20% (Machin, 1985) dry matter; cooked chicken breast muscles (Liu, 1995) when 3% rendered, 9.69% acidulated and 8.89% fermented wet matter poultry viscera diet were used; and cooked lamb roast (Shquier, 1984 and Fahny, 1992) when fish meal or liquefied fish were used as supplements in the diets. Moreover, inedible, spray-dried whole egg waste product can be satisfactorily incorporated into diets of channel catfish at levels up to 28.5% of the total diet.

Animal and plant-protein based diets had little influence on sensory characteristics of white amur (Bakir, 1993) or rainbow trout strains (Smith, 1988). Also, Lesiow et al.(1995) did not find any influence on functional properties and sensory characteristics of rainbow trout fillets stored up to 1 week on ice when five diets of fish meal protein was replaced with different proportions of animal by-products.

The objective of the current study was to determine if time of feeding (eight months in comparison with four months) rainbow trout with different diets has any influence on the dressing percentage of fish.

Experimental

Rainbow trout were reared in 15 tanks (3 tanks per treatment) fitted with drains. The water flow through the tanks was 5.27 l/min.. The water temperature in each tank was maintained between 10 and 12°C and dissolved oxygen levels were at 8.0 ppm. Fish were fed a control, a fish meal-based diet or diets were 25, 50, 75 or 100% of the fish meal protein was replaced with an animal by-product mixture (equal amounts of meat and bone meal, poultry by-products meal, blood meal, and feather meal) for four and eight months. Diets were iso-nitrogenous and contained 40% protein. Minerals, vitamins and essential amino acids (methionine and lysine) were added in accordance with the species requirements (National Res.Council, 1993). After fasting for 24 hours two fish from each tank (a total of six per diet) were sacrificed. The fish were individually weighted before and after evisceration. Than fish were filleted and weights of fillets were obtained.

Duncan's multiple comparison test (Octaba, 1986) was used to determine differences among the means ($P<0.05$).

Results and discussion

Dressing percentage based on body weight, eviscerated weight and fillet weight did not show a significant difference due to diet either after four or eight months of rearing of rainbow trout (Table 1). After eight months of rearing as expected the fish had higher body weight, eviscerated weight and length when compared with fish at four months. The highest rate (percentage of increase between 4 and 8 mo.) of body weight gain (from 2.72 to 3.39 times) , eviscerated weight (from 4.48 to 5.36 times) and length (from 2.87 to 2.99 times) in comparison with control sample was found for fish fed either the 25, 75 or 100% fish meal replacement diets. On the other hand fillets percentage yield difference in all five diet groups was lower after eight months than after four months even though the fillets increased in total weight. The percentage yields were lower by 4.35% for control diet and by 2.58% to 4.95% for the remaining diets. For rainbow trout fed 50 and 75% fish meal replacement the negative percentage fillet yield decrease (had a greater negative value) was greater than for the 25 or 100% replacement diet (more favorable).

This result minimized the expected positive effects of body weight and eviscerated weight gains after eight months in comparison with four months of fish feeding because these gains are not reflected in at least equal percentage rate of fillet weight. Also, the lower percentage rate of fillets weight in relation to body weight after eight months in comparison with the four months should suggest that from an economical point of view that trout feeding, in conditions of this

experiment, probably should not take longer than 8 mo. because fillets do not grow at the same rate as the total body.

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Table 1. Means, standard deviations ( ) and rates or percentage difference for weights, length and yield of fish (n=6) fed five different diets for four and eight months

Parameter	Time Months	Animal By-Product Replacement of Fish Meal 0%	25%	50%	75%	100%
Body Weight (g)	4	735.13 (125.46)	724.33 (139.24)	804.17 (94.39)	810.83 (162.36)	783.33 (71.05)
	8	852.33 (164.07)	1047.50 (299.43)	947.90 (215.69)	1134.67 (256.78)	1063.60 (170.63)
	Rate[a]	13.20%	44.62%	17.87%	39.94%	35.78%
Length (cm)	4	36.83 (2.23)	36.58 (2.20)	37.75 (1.54)	36.83 (2.50)	36.75 (0.85)
	8	38.06 (2.49)	40.09 (3.78)	39.28 (2.55)	40.51 (2.51)	40.28 (0.95)
	Rate[a]	3.34%	9.60%	4.05%	9.99%	9.61%
Eviscerated Weight (g)	4	646.95 (108.19)	629.78 (114.80)	688.53 (81.48)	710.42 (134.01)	675.28 (51.35)
	8	698.65 (112.79)	899.67 (219.89)	799.67 (196.77)	964.65 (226.50)	918.58 (115.10)
	Rate[a]	7.99%	42.85%	16.14%	35.79%	36.03%
Fillet Yield (% of whole body)	4	50.79 (3.44)	52.08 (2.73)	50.83 (2.45)	53.32 (2.23)	51.11 (3.01)
	8	46.44 (1.49)	49.50 (1.14)	45.88 (1.80)	48.73 (0.79)	48.09 (3.73)
	Difference[b]	-4.35%	-2.58%	-4.95%	-4.59%	-3.02%

a. Rate = [(8 Mo value - 4 Mo value)/ 4 Mo value] x 100
b. Difference = 8 Mo percentage value - 4 Mo percentage value