

Public Abstract

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Title:Enhancing bluegill production through least-cost diet development and novel rearing strategies

Amidst growing demand for large, food-size bluegill *Lepomis macrochirus*, lack of an affordable, balanced diet and inadequate rearing technologies remain the major concerns of bluegill producers seeking to run profitable businesses. Consequently, the present study was carried out to (i) develop a least-cost diet for juvenile bluegill and (ii) determine the extent that the two novel rearing strategies, "topping off" and "size grading", would increase bluegill growth and production. The study developed a nutritionally balanced, least-cost diet for juvenile bluegill by (i) determining the digestibility of commonly available feedstuffs that could form a balanced diet and reduce feed cost, (ii) determining dietary nutrient requirements, including digestible levels of essential amino acids, protein, and energy, (iii) formulating various experimental diets (nutritionally balanced) ranging from those containing much fish meal (most expensive) to those containing no fish meal (least expensive), and (iv) evaluating the formulated diets versus commercial trout and catfish diets for bluegill growth performance and identifying the best, most economically-feasible experimental diet. The least-cost diet lowered ingredient by ~35% relative to a fish meal based control diet and produced better fish growth performance relative to the commercial diets. Concerning rearing strategies, "topping off" was carried out to disrupt social hierarchy establishment and increase bluegill growth and production, whereas size grading was performed to form a bluegill stock of mostly fast-growing males, to increase bluegill production relative to mixed-sex bluegills. The study findings indicated benefits from both rearing strategies in terms of increasing bluegill production.