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Cheaper, Greener Fish Feed: Insects and Spirulina Can Replace Costly Fish Meal in Catfish Farming



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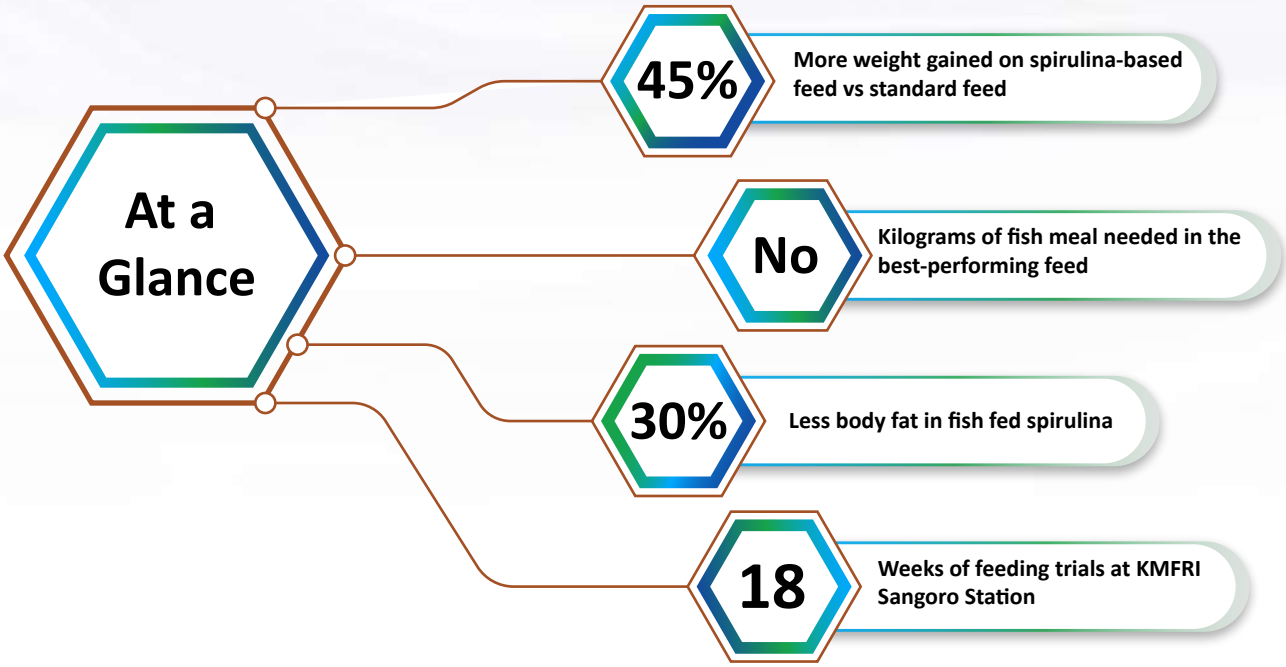
Cheaper, Greener Fish Feed: Insects and Spirulina Can Replace Costly Fish Meal in Catfish Farming

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Kenya Marine and Fisheries Research Institute

A study at KMFRI study shows African catfish grow faster and healthier on feed made from black soldier fly larvae and spirulina without any fish meal at all.

Feed is the biggest cost in fish farming often 60 to 70 percent of what a farmer spends. Most of that cost comes from fish meal, a protein made from wild-caught fish. Fish meal is excellent food, but it is expensive, its supply is limited, and using wild fish to feed farmed fish is not good for the ocean in the long run.

Scientists at the Kenya Marine and Fisheries Research Institute (KMFRI) asked a simple question: can we feed catfish something cheaper and more sustainable, without hurting how well they grow? The answer, it turns out, is yes.



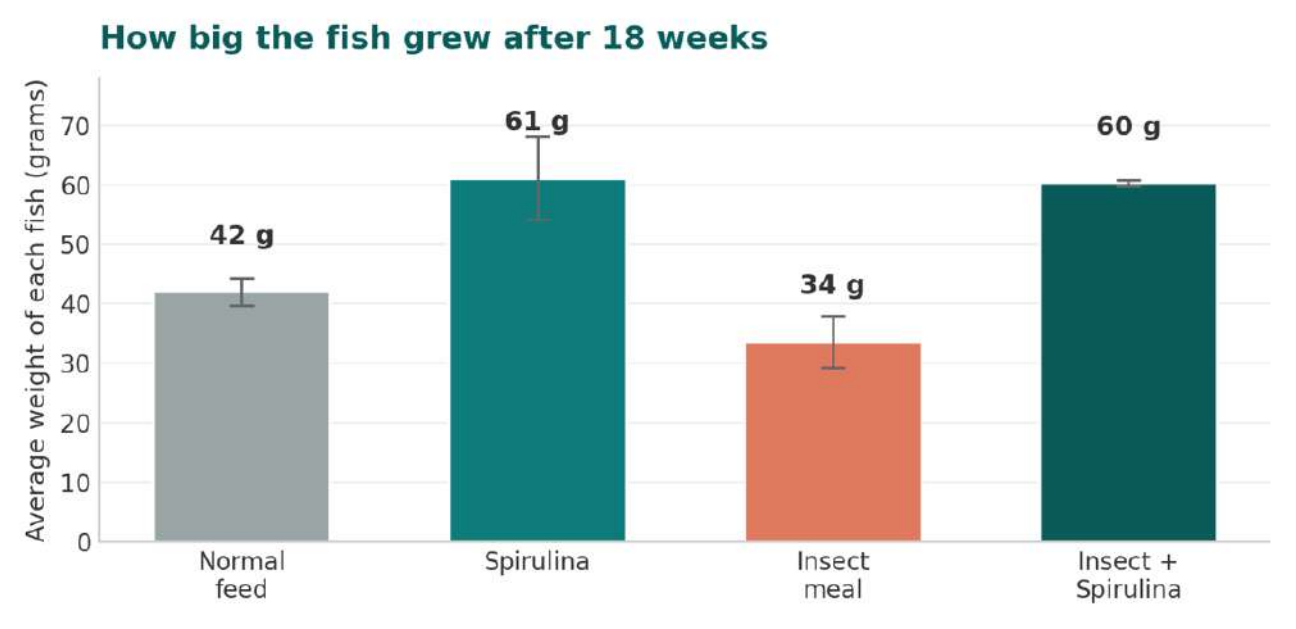
What the researchers did

At KMFRI's Sangoro Aquaculture Station near Lake Victoria, the team raised young African catfish for 18 weeks (126 days) on four different feeds:

- A standard feed made with fish meal (the usual choice).
- A feed where spirulina, a protein-rich blue-green algae replaced half the fish meal.
- A feed where black soldier fly larvae meal replaced half the fish meal.
- A feed with no fish meal at all, using an equal mix of spirulina and insect meal instead.

Bigger fish on the new feeds

The results were striking. Fish fed spirulina, either on its own or combined with insect meal grew the largest. Remarkably, the fish that ate no fish meal at all grew better than those on the standard feed.

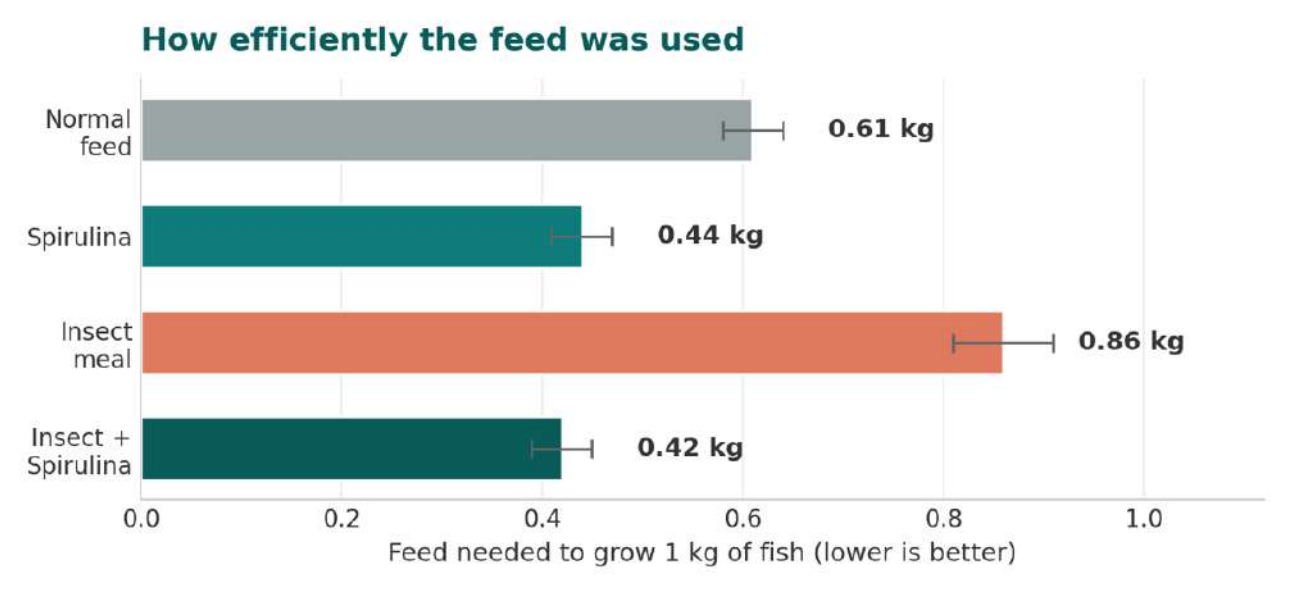


Fish fed on spirulina-based feeds ended the trial nearly half again as heavy as those on standard feed.



Less feed for more fish

Feed efficiency also improved. The best diets turned feed into fish growth far more efficiently, meaning a farmer needs less feed to grow the same amount of fish a direct saving on the biggest farm cost. The insect-only feed was the least efficient, requiring roughly twice as much feed per kilogram of fish.



Insect meal and spirulina feed produced a kilogram of fish on just 0.42 kg of feed.

How the four feeds compared

Diet	What's in it	How well fish grew	Feed efficiency
Normal feed (fish meal)	Standard fish meal	Good	Moderate
Spirulina (half swap)	Half fish meal, half spirulina	Best	Excellent
Insect meal (half swap)	Half fish meal, half BSF larvae	Weakest	Poorest
Insect + Spirulina (full swap)	No fish meal at all	Best	Excellent

Interestingly, insect meal on its own grew the smallest fish but pairing it with spirulina fixed the problem completely, as the two ingredients balance each other's nutrition.

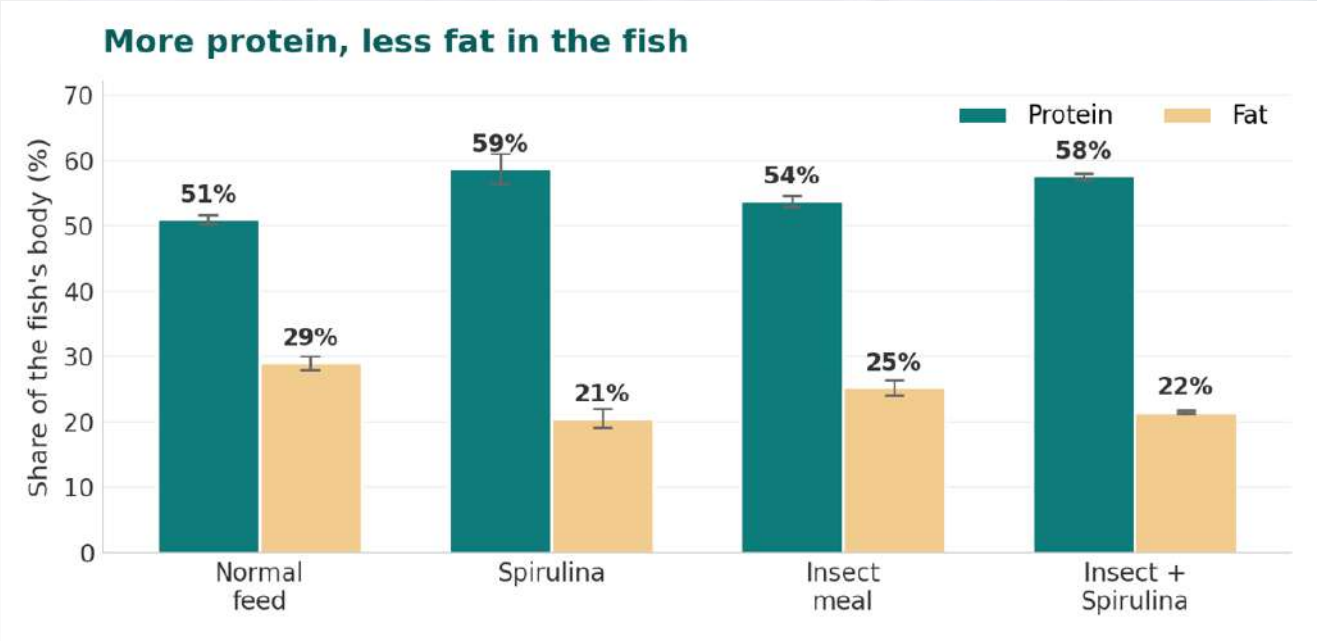
Healthy fish, better meat

Blood tests showed no harmful effects from any of the new feeds the fish stayed just as healthy as those on fish meal. On top of that, catfish fed spirulina ended up with more protein and less fat in their bodies. That means a leaner, more nutritious fish for consumers, and a product that stores better too.









Spirulina-fed catfish carried noticeably more protein and about a third less fat.

Why it matters

- Lower costs: Farmers can cut their single biggest expense by using less feed and cheaper, locally available ingredients.
- More sustainable: Replacing fish meal eases pressure on wild fish stocks, and insects can be grown on food and farm waste.
- Better fish: Faster growth and leaner, protein-rich meat benefit both the farmer and the dinner table.
- Local solution: Spirulina and black soldier fly larvae can be produced in Kenya, reducing reliance on imported feed ingredients.

The bottom line

This study shows that fish meal long thought essential can be completely replaced in African catfish feed with a smart blend of insects and spirulina, with no loss in growth or health. For fish farmers across Kenya and East Africa, that opens the door to feeds that are cheaper, greener, and produce better fish.

Acknowledgement

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