14.3.2. Building a Knowledge Base for Responsible Aquatic Food

Academic Year 2024–2025 | Evidence window: August 2024–July 2025

Introduction

Responsible aquatic food systems depend on reliable knowledge of how seafood is produced, harvested, marketed and consumed. For universities and coastal communities, decisions about aquatic food can be better informed when they draw on evidence concerning fish-farm operations, fishing pressure, production costs and relationships with local producers. Knowledge alone does not certify a product as sustainably sourced, but it helps establish the questions and standards needed for responsible choices.

During Academic Year 2024–2025, researchers affiliated with Davao Oriental State University (DOrSU) contributed studies on milkfish farming in the Davao Region, catch trends near marine protected areas (MPAs), and locally available feed ingredients. An earlier university initiative, Kadiwa sa Tate, is included as contextual evidence of links with local agricultural and fisheries producers. Taken together, these activities support education and discussion on the sustainability of aquatic food supply chains while distinguishing documented research from verified purchasing outcomes.

Understanding the Farms Behind Aquatic Food

Milkfish (Chanos chanos), commonly known as bangus, is an important aquaculture product in the Philippines. Understanding farm conditions is therefore necessary for evaluating how production decisions affect operating costs, livelihood viability and responsible use of inputs. Producers vary in their facilities, resources and constraints; a single management recommendation may not suit every farm.

A 2024 study by Macusi, Cayacay, Bongas and Macusi examined the typology of milkfish farms in the Davao Region, including farm operations, socioeconomic viability and production challenges. Published in the Egyptian Journal of Aquatic Biology & Fisheries, the study provides location-specific evidence about the circumstances in which milkfish are produced. This information can help educators, agricultural advisers and potential purchasers frame questions about farming practices and producer needs.

For responsible aquatic-food sourcing, understanding farm typologies is an important starting point: it can guide further assessment of feed use, farm management, production risks and potential economic implications. However, the study does not by itself establish that milkfish procured by DOrSU originated from audited farms or satisfied formal sustainability requirements. Such claims would require procurement policies, supplier verification and transaction records (Macusi et al., 2024).

University research also reaches the operational questions of responsible seafood trade. A review co-authored by DOrSU researchers, published in The Philippine Journal of Fisheries in December 2024, analysed 125 studies on fisheries traceability systems and identified the factors that drive their adoption, among them food safety, market compliance, consumer protection, and the need to combat illegal, unreported and unregulated fishing, as well as the barriers that hold adoption back, including costs, limited technical capacity, and insufficient infrastructure and regulation. The review recommends that government agencies overseeing fishery commodities link with academics and non-government organizations in implementing and monitoring traceability systems, a role the university's fisheries research program is positioned to fill in the region. The review documents the knowledge base for traceability adoption; it does not report an operating traceability system in the province.

References

Macusi, E. D., Nallos, I. M., Borazon, E. Q., Castro, M. M. C., & Peralez, C. (2024). Fisheries traceability, drivers, and barriers to its adoption: A review. The Philippine Journal of Fisheries, 31(2).

Macusi, E. D., Cayacay, M. A., Bongas, H. P., & Macusi, E. S. (2024). Typology of the milkfish (Chanos chanos) farms in Davao Region: Their operations, socio-economic viability, and challenges. Egyptian Journal of Aquatic Biology & Fisheries, 28(6), 1489–1510. https://doi.org/10.21608/ejabf.2024.396489

Scopus publication record: https://www.scopus.com/pages/publications/85212423451?origin=resultslist

Documenting Catch Trends Around Marine Protected Areas

Responsible consumption also depends on understanding the conditions of capture fisheries. Small-scale fishers contribute substantially to local food supplies, yet their catches are affected by fishing pressure, gear practices, environmental conditions and the effectiveness of marine protection measures. Monitoring landed catches offers a practical means of observing local fisheries and identifying questions for further management attention.

Manuel and Macusi (2025) used participatory catch assessments and landed-catch surveys near MPAs in Mati, Mabini, San Isidro and Lupon. The research documented differences among fishing locations and declining catch trends. The study reported catch ranges of 2.1–4.0 kg per trip in Mati and San Isidro, 10.1–20.0 kg per trip in Lupon, and 0.1–2.0 kg per trip in Mabini. These observations show why decisions on aquatic food and fisheries protection should not assume uniform production conditions across neighboring coastal areas.

The authors emphasized stricter enforcement of established no-fishing zones and improved fisheries databases. Involving fishers in catch documentation recognizes their role as contributors to locally relevant scientific information. Repeated assessment can also strengthen the basis for evaluating changes in local fishing grounds. However, decreasing catches do not, on their own, prove a single cause or demonstrate an outcome of particular management interventions (Manuel & Macusi, 2025).

References

Manuel, R. P., & Macusi, E. D. (2025). Catch trends of small-scale fishers near marine protected areas in southeastern Philippines. Marine and Fishery Sciences, 38(3), 389–403. https://doi.org/10.47193/mafis.3832025010706

Scopus publication record: https://www.scopus.com/pages/publications/105012848391?origin=resultslist

Local Food Partnerships Provide a Starting Point

Sustainable aquatic-food choices require attention not only to production but also to how food reaches consumers. Connections among local producers, institutions and buyers may create opportunities for improved market access and more transparent purchasing. Nevertheless, local origin and sustainability are different attributes and should not be treated as equivalent.

On May 8, 2024, DOrSU launched Kadiwa sa Tate, a university initiative intended to provide affordable food items to consumers while supporting the income of farmers, fisherfolk and micro, small and medium enterprises. The activity was undertaken with the Department of Agriculture–Region XI and Provincial Agriculture–Davao Oriental. It provides a documented example of university engagement with local producer networks (DOrSU PIO, 2024).

Because the launch preceded AY 2024–2025, it is presented here only as background. The available announcement does not verify continued operation, volumes of aquatic-food sales, certification of suppliers, or sustainable seafood procurement during the reporting period. Establishing these outcomes would require dated transaction records, purchasing criteria, supplier information and documentation of program continuity.

References

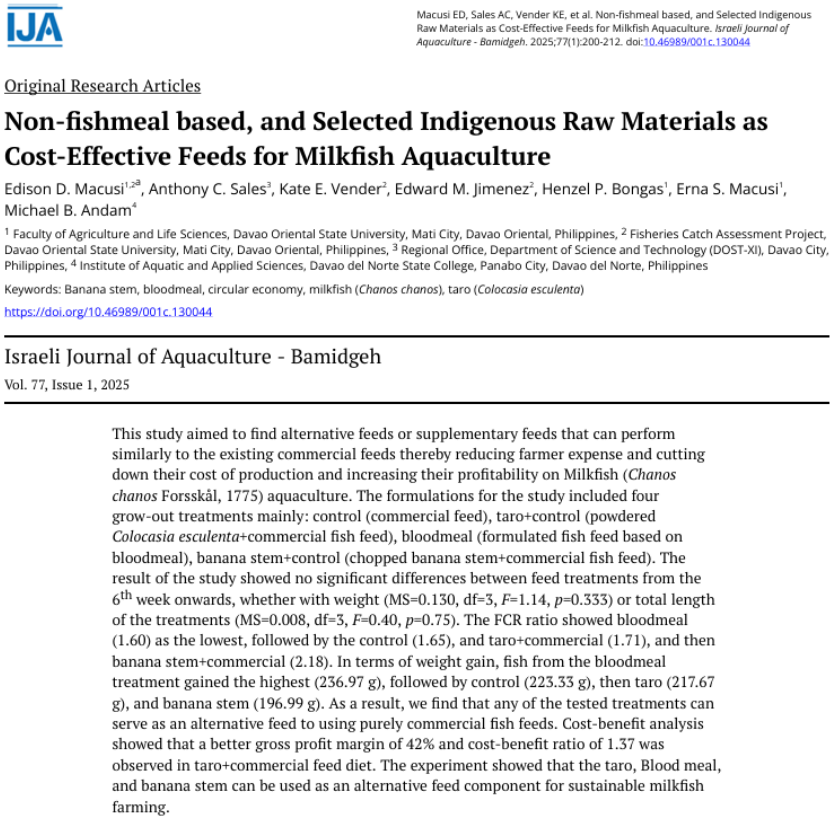
Davao Oriental State University, Public Information Office. (2024, May 8). DOrSU launches program to provide affordable food items; increase income of farmers, fisherfolk. https://dorsu.edu.ph/dorsu-launches-program-to-provide-affordable-food-items-increase-income-of-farmers-fisherfolk/

Research-Based Guidance for Sustainable Aquaculture

Feed is a major management consideration for milkfish farmers because it influences the cost of rearing fish as well as the resources used in production. Researchers working with DOrSU's Faculty of Agriculture and Life Sciences, the Fisheries Catch Assessment Project and partner institutions investigated alternatives to exclusive reliance on conventional commercial feeds. Two 2025 publications provide directly relevant experimental evidence for this discussion.

One study compared commercial feed with formulations incorporating locally available materials such as taro, bloodmeal and banana stem. Another assessed indigenous ingredients for juvenile milkfish, including copra meal and Azolla, in relation to growth and feed utilization efficiency. Together, the papers show how alternative feed materials can be evaluated in controlled trials rather than assumed to be interchangeable with standard formulations.

The value of these studies for farmer education is the evidence they supply about selected diets and measured production responses. Their findings can help farmers and extension personnel assess which ingredients deserve further examination, what trade-offs may be involved, and why formulation and local production conditions matter. Encouraging trial results should not be generalized automatically to every farm, and improved ecological performance or economic savings at scale require further validation (Macusi, Sales, Vender, et al., 2025; Macusi, Sales, Jimenez, et al., 2025).



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Macusi ED, Sales AC, Vender KE, et al. Non-fishmeal based, and Selected Indigenous Raw Materials as Cost-Effective Feeds for Milkfish Aquaculture. *Israeli Journal of Aquaculture - Bamidgeh*. 2025;77(1):200-212. doi:10.46989/001c.130044

Original Research Articles

Non-fishmeal based, and Selected Indigenous Raw Materials as Cost-Effective Feeds for Milkfish Aquaculture

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Keywords: Banana stem, bloodmeal, circular economy, milkfish (*Chanos chanos*), taro (*Colocasia esculenta*)

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This study aimed to find alternative feeds or supplementary feeds that can perform similarly to the existing commercial feeds thereby reducing farmer expense and cutting down their cost of production and increasing their profitability on Milkfish (*Chanos chanos* Forsskål, 1775) aquaculture. The formulations for the study included four grow-out treatments mainly: control (commercial feed), taro+control (powdered *Colocasia esculenta*+commercial fish feed), bloodmeal (formulated fish feed based on bloodmeal), banana stem+control (chopped banana stem+commercial fish feed). The result of the study showed no significant differences between feed treatments from the 6th week onwards, whether with weight (MS=0.130, df=3, F=1.14, p=0.333) or total length of the treatments (MS=0.008, df=3, F=0.40, p=0.75). The FCR ratio showed bloodmeal (1.60) as the lowest, followed by the control (1.65), and taro+commercial (1.71), and then banana stem+commercial (2.18). In terms of weight gain, fish from the bloodmeal treatment gained the highest (236.97 g), followed by control (223.33 g), then taro (217.67 g), and banana stem (196.99 g). As a result, we find that any of the tested treatments can serve as an alternative feed to using purely commercial fish feeds. Cost-benefit analysis showed that a better gross profit margin of 42% and cost-benefit ratio of 1.37 was observed in taro+commercial feed diet. The experiment showed that the taro, Blood meal, and banana stem can be used as an alternative feed component for sustainable milkfish farming.

Figure 1. First-page publication image of the 2025 milkfish alternative-feed study in the Israeli Journal of Aquaculture – Bamidgeh. Source: Macusi, Sales, Vender, et al. (2025); reproduced from the supplied DOrSU SDG 14 reference report.

References

Macusi, E. D., Sales, A. C., Vender, K. E., Jimenez, E. M., Bongas, H. P., Macusi, E. S., & Andam, M. B. (2025). Non-fishmeal based, and selected indigenous raw materials as cost-effective feeds for milkfish aquaculture. Israeli Journal of Aquaculture – Bamidgeh, 77(1), 200–212. https://doi.org/10.46989/001c.130044

Macusi, E. D., Sales, A. C., Jimenez, J. E. M., Vender, E. K. E., Bongas, H. P., Macusi, E. S., & Andam, M. B. (2025). Assessment of indigenous feed ingredients on growth and feed utilization efficiency in juvenile milkfish (Chanos chanos Forsskål, 1775). Israeli Journal of Aquaculture – Bamidgeh, 77(2), 231–244. https://doi.org/10.46989/001c.138435

Scopus publication records: https://www.scopus.com/pages/publications/105016164755?origin=resultslist ; https://www.scopus.com/pages/publications/105009099578?origin=resultslist

Conclusion

DOrSU's work under Indicator 14.3.2 demonstrates how university research can strengthen the knowledge base for responsible aquatic food systems. Studies of regional milkfish-farm operations, catch trends near MPAs and alternative feed ingredients offer evidence that can inform education, producer support and discussions of fisheries and aquaculture sustainability. The earlier Kadiwa sa Tate partnership adds historical context for engagement with farmers and fisherfolk.

These contributions are best understood as research, knowledge dissemination and institutional linkage. The reviewed records do not establish a formal university policy on sustainable aquatic-food procurement, verified sustainable seafood purchases, or documented seafood sourcing outcomes for AY 2024–2025. Progress toward those goals would require procurement standards, traceability information, supplier records and continued monitoring. The documented achievement is a stronger scientific and institutional foundation on which responsible purchasing and aquatic-food stewardship could be developed.