XERAYA CAPITAL
Life Venture

The New Superfood:

Is Fungal Flour Better for You Than Wheat?





Executive Summary

Fungal ingredients are creating opportunities at the intersection of nutrition, industrial biotechnology and food security. Their commercial appeal lies in enriching familiar foods with protein and fibre, supported by fermentation processes that can deliver consistent production. The strongest investment thesis centres on ingredients that solve specific formulation problems at an acceptable cost.

Recent regulatory milestones strengthen market access, but success still depends on taste, manufacturing economics and repeat purchasing. For Malaysia, the opportunity is to develop regional ingredient and manufacturing capabilities aligned with food security and higher-value bioeconomy activity.



Why Fungal Ingredients Matter Now

Improving everyday foods could bring nutritional innovation to consumers without requiring wholesale changes in eating habits. Malaysia's National Health and Morbidity Survey 2024 found that 30.5% of adults were overweight and 23.1% were obese. These findings strengthen the rationale for better food formulations, although no individual ingredient can resolve a population-wide dietary challenge.

Supply resilience adds another dimension. Malaysia depends on imported wheat, creating an incentive to diversify ingredient sources and develop domestic production capabilities. Fungal enrichment could contribute incrementally, provided fermentation inputs are themselves reliably sourced. It should not be presented as an immediate substitute for the country's staple grain requirements.

For manufacturers, the practical opportunity is to improve the nutritional profile of bread, noodles, snacks and prepared meals while preserving the qualities that drive repeat purchases.

Understanding Fungal Flour and Fermentation

“Fungal flour” covers several distinct ingredients. Mushroom powder usually consists of dried, milled fruiting bodies. Mycelium is the network of fungal filaments that can be cultivated separately. Mycoprotein generally refers to protein-rich fungal biomass produced through fermentation. Their composition and performance are not interchangeable.

In biomass fermentation, selected fungi consume nutrients in controlled vessels. Producers manage growth conditions, harvest the biomass and apply downstream processing, which may include heat treatment, washing, drying and milling. The biomass itself becomes the ingredient. This differs from precision fermentation, where microorganisms manufacture a targeted substance that is subsequently recovered.

The nutritional potential is tangible but product-specific. EFSA’s assessment of Rhizomucor pusillus biomass powder reported approximately 51% crude protein and 31% dietary fibre. However, the presence of all essential amino acids did not translate automatically into high protein quality: digestibility and amino acid balance remained important qualifications. These figures describe one ingredient, not fungal flour generally.

Food formulation also involves trade-offs. A 2025 study replacing 3–12% of wheat flour with selected mushroom powders increased beta-glucans and reduced starch digestibility in laboratory tests, but also reduced protein digestibility. Such findings support further development, they do not establish clinical benefits in consumers.

The immediate commercial proposition is therefore targeted enrichment. Final products need validation for texture, flavour, nutritional value and shelf life. Safety assessment must also address strain identity, allergenicity and potential contaminants.



Market Size and Growth Dynamics

The adjacent mycoprotein market offers a useful sizing benchmark. It includes applications beyond bakery ingredients and should not be treated as a standalone fungal-flour TAM.
Fortune Business Insights' October 2026 update provides the following estimates and forecasts.

Market indicator	Estimate or forecast
Global mycoprotein market in 2025	US$510.54 million
Global market in 2026	US$545.15 million
Global market in 2034	US$930.65 million
Forecast CAGR for 2026–2034	6.91%
Europe in 2025	US$323.51 million; 63.37% share
North America in 2025	US$96.90 million
Asia Pacific in 2025	US$59.17 million

These are commercial research estimates, not audited industry sales. Europe's concentration suggests an established market base, while Asia Pacific's smaller position leaves room for development without proving that adoption will accelerate.





Investors should build an application-specific total addressable market from eligible food categories, permitted inclusion rates, customer volumes and realistic ingredient prices. Adding mushroom, alternative-protein and functional-food market estimates would risk substantial double counting.

Capital availability also warrants discipline. GFI reports that the broader fermentation sector raised US$357 million in 2025, down from US$632 million in 2024. Its latest figures show US$32 million raised in the third quarter of 2026. These funding figures cover more than fungal ingredients, but reinforce the importance of demonstrating commercial demand before expanding capacity.

Regulation and Sustainability as Catalysts

Regulatory progress is making specific products commercially actionable. EU Regulation 2026/1507 authorised Rhizomucor pusillus mycelium in July 2026 under defined conditions of use. Permitted powder applications include biscuits, cereal bars, flatbreads and steamed breads. This directly supports the thesis that fungal biomass can serve mainstream food formulations.

Singapore provides an ASEAN precedent. SFA's March 2026 list includes several fungal ingredients, including Pleurotus pulmonarius mycelium approved in September 2025. These decisions concern specified products and processes, they do not confer automatic approval across ASEAN.

Environmental performance is another potential driver, but must be measured. A 2026 life-cycle study compared modelled mycoprotein production with a German pork production chain, estimating 94% lower land use impacts and 70% lower water use impacts per kilogram of protein. It could not establish a conclusive greenhouse-gas advantage. Feedstock production and energy demand materially affected the outcome. Those results cannot be transferred directly to a comparison with wheat flour.

For investors, energy-efficient processing and credible life-cycle evidence can therefore become sources of differentiation.

Investment Opportunities for Malaysia and ASEAN

Malaysia's Thirteenth Malaysia Plan for 2026–2030 prioritises food security, research commercialisation and development of the halal ecosystem. Fungal ingredients could support these objectives, although policy alignment alone does not establish commercial viability or eligibility for incentives.

Local research provides a starting point. Universiti Malaya researchers have investigated mushroom-enriched chicken patties alongside bioreactor biomass production. The next challenge is translating research into reproducible specifications, competitive costs and customer commitments.

Three areas merit particular attention.

Business-to-business ingredient platforms

Processing and manufacturing technologies

Regional commercial partnerships

Investment Opportunities for Malaysia and ASEAN



Business-to-business ingredient platforms can supply food manufacturers with powders or blends tailored to bread, noodles, snacks and hybrid protein products. Defensibility should come from strain performance, process know-how, application data and customer qualification. A manufacturer's willingness to reorder at a viable price matters more than an attractive laboratory formulation.



Processing and manufacturing technologies offer opportunities in fermentation control, oxygen delivery, contamination prevention and downstream processing. Drying and energy integration deserve scrutiny because a powder must be economical to produce and distribute. Techno-economic research shows that fermentation configuration and product characteristics materially influence costs; laboratory yields alone are insufficient evidence of competitiveness.



Regional commercial partnerships could combine Malaysian research and production with food manufacturers and ingredient distributors serving ASEAN. Halal certification should be designed into sourcing and processing from the outset. Singapore's regulatory experience may inform development plans, while each destination market requires its own assessment.

A practical strategy would begin with a small number of applications and anchor customers, then release capital against agreed milestones. These should include repeatable pilot batches, regulatory readiness, acceptable sensory results and binding purchase commitments. Full-scale facilities should follow credible demand and demonstrated scale-up performance.

The investment case must also withstand downside scenarios: lower plant utilisation, higher energy prices, inconsistent feedstocks and longer customer qualification cycles. Food-grade agricultural side streams may offer advantages, but preprocessing, traceability and contamination controls must be included in the economics.





Conclusion

Fungal flour has a credible role in functional nutrition when its benefits are established in the finished food. Commercial success will depend on reliable ingredients that manufacturers can incorporate profitably and consumers choose repeatedly.

For Malaysian and ASEAN investors, the strategic opportunity is to connect research, manufacturing and market access around specific customer needs. Companies that demonstrate nutritional value, manage regulatory and production risks, and secure recurring demand will offer the strongest foundations for durable returns. The next stage of this sector should be judged by successful formulations and sustainable margins.



Sources

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