OIL PALM-BASED BROILER FEED FORMULATIONS

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The broiler feed industry has evolved significantly over the decades, driven by the need for efficient and cost-effective nutrition to support the rapid growth of broiler chickens. Traditionally, conventional feed formulations have relied heavily on corn and soybean meal as primary sources of energy and protein, respectively. However, with fluctuating prices and concerns over sustainability, alternative feed ingredients have gained attention, including oil palm-based ingredients. These oil palm-derived ingredients offer several benefits, including cost reduction, improved feed conversion efficiency, and enhanced energy content due to their high oil levels. Additionally, their inclusion in broiler diets contributes to the sustainability of the palm oil industry by utilising agro-industrial by-products, reducing waste, and promoting a circular economy. Research has shown that with proper processing and supplementation, oil palm-based ingredients can support broiler growth performance, making them a promising alternative in modern poultry nutrition.

In 2024, Malaysia's broiler feed industry continued to rely heavily on imported feed. The country imported 3.85 million tonnes of corn in the year 2023, reflecting a 9% increase from the previous year (Index Mundi, 2025). Malaysia's soybean meal consumption for the marketing year 2024/2025 is projected to reach 1.64 million tonnes, an increase of 75,000 tonnes compared to the previous year's consumption of 1.56 million tonnes (USDA Foreign Agricultural Service, 2024). This dependence on imports exposes the industry to global market fluctuations and currency exchange risks, as feed costs constitute a significant portion of production expenses. In order to mitigate these challenges, oil palm-based broiler feed formulations offer a promising solution to reduce reliance on imported materials and enhance the sustainability of broiler feed production.

Malaysia produced approximately 2.4 million tonnes of poultry feed in the year 2023 (Statista, 2024). Feed costs constitute a significant portion of broiler production expenses, accounting for up to 70% of the total livestock production costs. By substituting 10% of imported corn and soybean meal with oil palm-based ingredients, Malaysia could potentially reduce feed costs, as alternative ingredients such as oil palm by-products are often more cost-effective. This substitution could lead to substantial savings in broiler feed production, though the exact amount would depend on current market prices and the nutritional equivalence of the substituted ingredients.

THE TECHNOLOGY

The technology offers two types of broiler feed formulations: Starter feed, used from day 1 to day 21, and grower feed, used from days 22 to 35 (until harvest). These formulations incorporate oil palm feed ingredients to partially replace imported feed ingredients. The starter feed is produced in crumble form, while the grower feed is processed into pellets (*Figure 1*). *Table 1* presents the nutritional values of both feed formulations, with commercial feed and standard broiler feed specifications used as references to ensure optimal nutrition at each growth stage.

A 35-day feeding trial was conducted at a commercial broiler farm in Kampung Bagan, Batu Pahat, Johor, involving a total of 900 mixed-sex Ross 308 breed chicks (*Figure 2*). The chicks were divided into two groups, with one group was fed oil palm-based feed (MPOB), while the other group received commercial feed (COM). Broilers fed MPOB showed better weight gain than those

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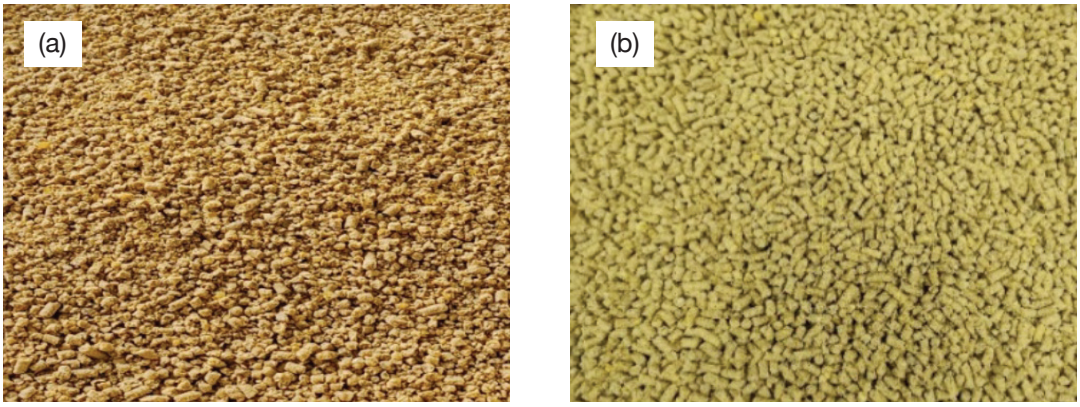

Figure 1. Oil palm-based broiler feeds (a) starter feed in crumble form, and (b) grower feed in pellet form.

TABLE 1. NUTRITIONAL VALUES OF BROILER STARTER AND GROWER FEEDS

Proximate composition (%)	Treatment		Standard specification*
	MPOB	COM	
Broiler starter feed			
Moisture	10.77 ± 0.38	11.43 ± 0.08	Max, 13
Total ash	6.31 ± 0.10	6.27 ± 0.04	Max, 8
Crude fat	6.02 ± 0.19	7.04 ± 0.15	Min, 5
Crude protein	24.21 ± 0.03	24.02 ± 0.25	Min, 21
Crude fibre	3.70 ± 0.31	3.66 ± 0.30	Max, 5
Gross energy (cal/g)	4,585 ± 11.50	4,678 ± 7.09	Min, 2,900
Broiler grower feed			
Moisture	8.76 ± 0.08	11.73 ± 0.08	Max, 13
Total ash	6.03 ± 0.09	5.58 ± 0.03	Max, 8
Crude fat	7.77 ± 0.17	8.36 ± 0.11	Min, 5
Crude protein	22.15 ± 0.68	22.02 ± 0.24	Min, 19
Crude fibre	4.06 ± 0.45	3.70 ± 0.31	Max, 5
Gross energy (cal/g)	4,660 ± 13.61	4,756 ± 4.21	Min, 3,100

Note: MPOB - oil palm-based feeds; COM - commercial feeds.
*Source: Malaysian Standard, (2008)

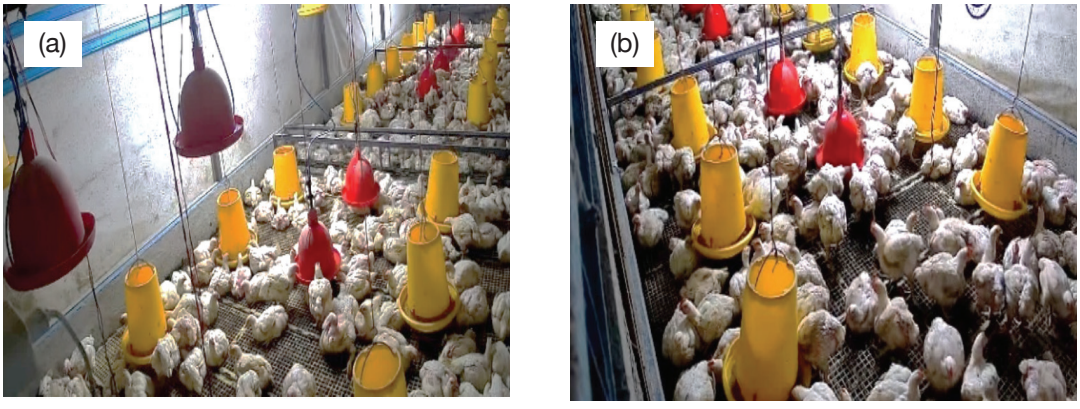

Figure 2. Feeding trial on day 35 (a) MPOB-feed house and (b) COM-feed house.

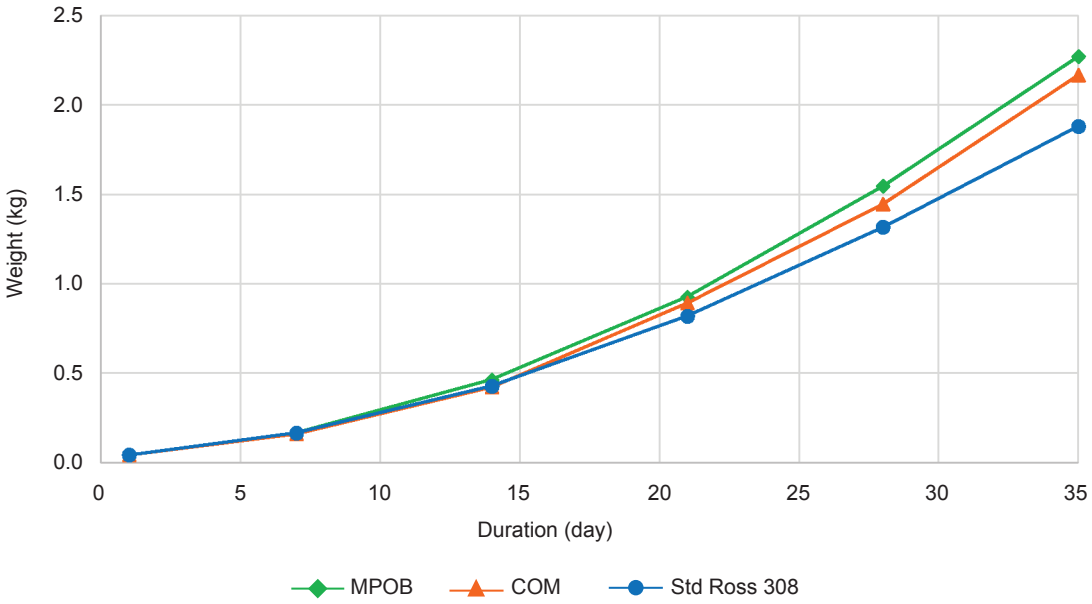

Figure 3. Growth curve of broiler fed with MPOB and COM for 35 days of feeding trial.

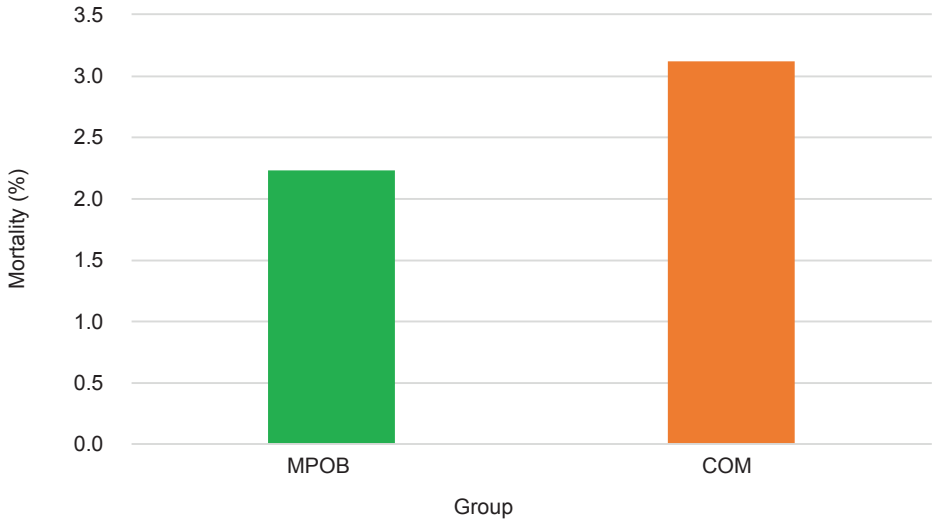

Figure 4. Mortality of broiler fed with MPOB and COM feeds throughout the 35 days of feeding trial.

fed COM during the starter period (day 21) at 0.93 kg and 0.84 kg, respectively, and the grower period (day 35) at 2.27 kg and 2.17 kg, respectively (*Figure 3*). Both groups had low mortality rates, with only 2.22% in the MPOB group and 3.11% in the COM group (*Figure 4*).

The study also assessed the feed conversion ratio (FCR) and Broiler Performance Index (BPI) of each group (*Table 2*). Despite consuming slightly less feed, broilers fed MPOB showed a higher weight gain, resulting in a better FCR of 1.32 compared to 1.40 for the COM group. The BPI for the MPOB group was also higher (490.14) than the COM group (436.48), indicating better overall performance. These results suggest that oil palm-based feed can be a viable alternative to commercial feed, offering comparable or even improved growth performance and feed efficiency in broiler production.

NOVELTY

Oil a sustainable alternative for poultry farming, by utilising locally sourced ingredients. The balanced inclusion of palm-based ingredients ensures optimal growth, feed efficiency, and overall performance in poultry production.

BENEFITS AND ADVANTAGES

Cost-saving Solutions
Substitutes expensive imported ingredients, reducing feed costs.

TABLE 2. PERFORMANCES OF BROILER FED OIL PALM-BASED AND COMMERCIAL FEEDS

Broiler performances	MPOB	COM
Weight at arrival (kg)	0.043	0.043
Average feed intake days 1-35 (kg)	2.94 ± 0.04	2.98 ± 0.01
Average weight gain days 1-35 (kg)	2.23 ± 0.07	2.13 ± 0.02
Feed conversion ratio	1.32 ± 0.05	1.40 ± 0.01
Broiler performance index	490.14	436.48

Note: MPOB - oil palm-based feed formulations; COM - commercial feed.
Feed conversion ratio = feed intake / weight gain;
Broiler performance index = [(weight gain x survivor rate) / (FCR x days of feeding)] x 100

Reliable Supply
Readily available from Malaysia's palm oil industry.

Proven Performance
Supports excellent broiler growth, FCR, and feed efficiency.

Smart Resource Utilisation
Converts oil palm by-products into high-value nutrition.

Strengthens Food Security
Reduces reliance on imports for a stable feed supply.

ECONOMIC ANALYSIS

The economic analysis assumes a production cost of RM95.50 per 50 kg bag. Estimation was based on production capacity of 4 t/h, operating 8 h per day for 28 days per month, and projected sales growth from the first to the tenth year.

CONCLUSION

The oil palm-based broiler feed formulations offer a cost-effective, nutritionally balanced solution that boosts broiler growth, improves feed conversion efficiency, and enhances overall performance, making them an ideal choice for modern poultry production.

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