

OIL PALM-BASED BEEF CATTLE FEED PELLET FORMULATION

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MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2022

MPOB TT No. 680

Malaysia has met local demand for poultry meat and has been self-sufficient since 1984. However, the ruminant subsector which is dominated by beef is not well developed. Due to this situation, Malaysia has been facing difficulties in having a sustainable and sufficient supply of red meat throughout the year. Ruminant production is limited by issues related to feeding supply. The current emphasis is on the development of practical and low-cost feeds for various classes of ruminant species. Low utilisation of fibre resources and lack of practical techniques to convert local feedstuffs to quality feeds are some of the limitations in the development of feed for local ruminant livestock.

Oil palm plantations in Malaysia cover 17.9% of the total land area and more than 70% of the national agricultural land area. In 2021, oil palm cultivation takes up a total land area of 5.74 million hectares (MPOB, 2022). As a major producer of the world's palm oil, Malaysia's oil palm industry generates a huge amount of by-products annually which includes palm kernel cake (PKC) and empty fruit bunch (EFB). These by-products can be considered a good alternative to the expensive imported raw materials such as corn and soybean meal for the beef cattle feed industry.

Most oil palm biomass has great potential to be utilised as components in feeds, especially for a ruminant. They can be processed into pellets before being used effectively in livestock ration (Mohamed *et al.*, 2012). The biomass is suitable to be used in ruminant feed because of its nutrients and fibre composition (Zahari *et al.*, 2003). Other researchers have shown improvements in feed intake and performance of animals receiving feed with the inclusion of oil palm biomass through optimal formulation and processing (Abubakr *et al.*, 2013; Karimizadeh *et al.*, 2017; Zahari and Alimon, 2005).

THE TECHNOLOGY

A feed pellet formulation for beef cattle using oil palm products and by-products as the main ingredients has been developed by MPOB. This formulation contains palm kernel cake (PKC), empty fruit bunch (EFB), crude palm oil (CPO) and other minor ingredients which is a nutrient-balanced and cost-effective feed pellet (*Figure 1*). In addition, the processing method for the feed pellet production will be included in the TOT package.



Figure 1. Oil palm-based feed pellet for beef cattle developed by MPOB.

The feed pellet is formulated by MPOB with the incorporation of complete nutritional components for beef cattle in accordance with the nutrient specification, as shown in *Table 1*.

TABLE 1. PROXIMATE ANALYSIS OF MPOB BEEF CATTLE FEED PELLET

Proximate analysis	MPOB
Moisture (%)	7.35
Ash (%)	3.73
Crude protein (%)	17.30
Crude fibre (%)	14.40
Gross energy (calorie/g)	4769

HIGHLIGHT OF THE TECHNOLOGY

Beef cattle feed pellet formulation, with the inclusion of 80% ingredient comprising of oil palm products and by-products leads to a cost-saving and consistent supply of raw materials without sacrificing the beef cattle growth performances.

BENEFITS AND ADVANTAGES

This formulation contains palm kernel cake (PKC), empty fruit bunch (EFB) and crude palm oil (CPO) which offers an alternative to the imported and expensive raw materials as these raw materials are available locally and throughout the year. Utilisation of oil palm products and by-products provides cost savings for beef cattle feed pellet production and can be sold at a competitive price in the market. Furthermore, the formulation has been developed to contain a complete nutrient requirement for beef cattle.

ECONOMIC ANALYSIS AND COMMERCIAL BENEFITS

The estimated economic analysis for MPOB feed pellet formulation is shown in Table 2. This evaluation is based on the assumptions that the feed pellet is sold at RM1.20/kg, the production capacity of 1 t/hr, production operation at 8 hr/day, 28 days/month and sales increase from the first year to the tenth year.

TABLE 2. ECONOMIC ANALYSIS OF MPOB FORMULATION FOR BEEF CATTLE FEED PELLETT

Economic analysis	Value
Net present value (NPV)	RM1 350 723.00
Internal rate of return (IRR)	30.83%
Discounted payback period	3.8 years
Discounted benefit: Cost ratio	1.08 : 1

IP STATUS

Protected as Trade Secret.

CONCLUSION

There is a high demand for beef cattle feed pellet and this can be sold at a competitive price as the commercial feed pellet available in the market. MPOB formulation containing oil palm by-

products offers cost-saving for pellet production and contains complete nutrients to support the beef cattle growth.

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