PALM-BASED MUNG BEAN CAKE

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The mung bean (*Vigna radiata*), also known as green bean, is a plant species in the legume family. Mung is normally ground into flour and processed into bean cake. The mung bean cake is a traditional snack in China. It is consumed as a delicacy in many parts of China.

The ingredients of mung bean cake are mung bean, wheat flour, glutinous rice flour, oil, fats and sugar. Generally, the oil content in these products is about 10% to 25%. Rapeseed oil, soyabean oil, sesame oil and lard are normally used to prepare the mung bean cake.

MPOB has successfuly developed palm-based mung bean cake. Palm-based mung bean cake has similar quality that matches the commercial products in terms of palatability and physical appearance. Palm-based mung bean cake does not only maintain the taste and flavour of the controlled product but also reduces its cost.

TECHNOLOGY OFFERED

The technology offered is palm-based blended oil and its application in mung bean cake. Three palm-based blended oils have been formulated for mung bean cake. The sensory evaluation (*Table 1*) shows that the blended oils are comparable to commercial samples. The desired blending ratio between palm oil fractions and soyabean oil was achieved using direct blending method. Blending is the most cost-effective method to tailor the formulation to suit the physicochemical requirements for mung bean cake.

INGREDIENT AND PROCESSING

The mung bean cake was formulated with palm based oil as the fat component. The non-fat components of mung bean cake are mung bean, flour, sugar and water.

The process flow of mung bean cake production is shown in *Figure 1*. In the process, the baking temperature should be controlled at 200°C.

TABLE 1. SENSORY EVALUATION OF MUNG BEAN CAKE

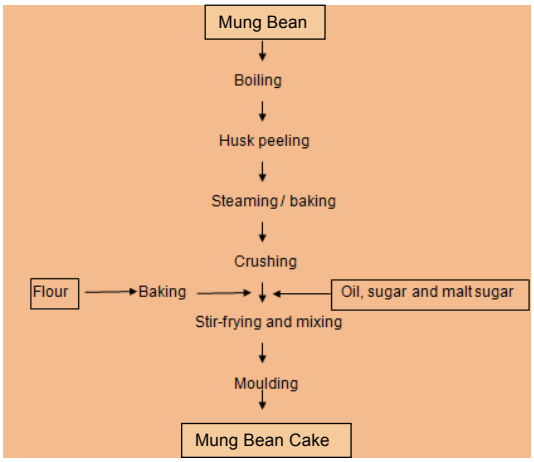

Figure 1. Process flow of mung bean cake production.

No.	Mung bean cake sample	Sensory evaluation					
		Colour	Texture	Taste and flavour	Form	Impurity	Total
Control	SBO based mung cake	2.1±0.3	4.2±0.1	5.8±0.8	2.8±0.2	2.0±0.1	16.8±0.6
1	Super olein based mung cake	2.1±0.1	3.5±0.3	6.0±0.3	2.6±0.3	2.0±0.2	16.1±0.2
2	Palm olein based mung cake	1.9±0.1	4.4±0.5	6.3±0.2	2.7±0.1	2.0±0.1	17.3±0.6
3	Palm stearin based mung cake	2.2±0.1	4.4±0.3	6.4±0.8	2.6±0.2	2.0±0.1	17.5±0.8

Note: SBO = Soyabean oil.

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TABLE 2. ESTIMATED EXPENDITURE AND ECONOMIC VALUES

Item	Value
Capital asset	RMB 350 000 (RM 214 940.74)
Benefit to cost ratio	1.22
Pay back period, (yr)	3
Internal rate of return (IRR),%	86.40
Net present value (NPV) @ 10%	RMB 3 944 777 (RM 2 422 769.31)
Return on investment (ROI),%	26.76

PRODUCT CHARACTERISTICS

Based on the sensory evaluation, palm-based mung bean cake has a uniform and glossy appearance, non-oily surface and tender texture. The taste of the palm-based mung bean cake is acceptable because it has a good flavour.

NOVELTY

Palm-based mung bean cake.

Figure 2. Palm-based mung bean cake.

BENEFITS

Good flavour, cost-effective ingredient and lower production cost.

MARKET POTENTIAL

Currently, there are more than 800 mung bean cake manufacturers in China using modern mechanised technology for mass production, where most of them are located in the Southern, Eastern and Northern regions of China. In 2016, the annual sale of mung bean cake industry was more than RMB 55 billion. The production of mung bean cake is 280 000 t yr^{-1} which requires about 40 000 t of oils and fats annually.

ECONOMIC EVALUATION

The investment for the production of palm-based mung bean cake is financially feasible as shown in *Table 2*. The estimated total investment is RMB 2 752 400 (RM 1 690 352.36) with a capital asset of approximately RMB 350 000 (RM 214 940.74). The parameters shown are evaluated based on the price of mung bean cake product at RMB 20 kg^{-1} (approximately RM 12.33 kg^{-1}). The investment will generate an income of RMB 4 000 000 (RM 2 456 260.46) after three years.

CONCLUSION

Palm-based blended oils were successfully used in the production of palm-based mung bean cake. Palm-based mung bean cake has the quality performance that matches commercial products based on sensory evaluation and its physical appearance. It has better stability and reduced oil migration.

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