

Liquid shortening as the name implies, has both liquid and shortening properties. It can be used directly in the continuous production line for cake or bread. Liquid shortening is mainly made from liquid oil with a small amount of emulsifier and carotene. This is used in the manufacturing of moon cake crust. Most liquid shortenings in the Chinese market are made of soyabean oil because of its liquid form. MPOB has successfully developed liquid shortening using palm super olein.

TECHNOLOGY OFFERED

The technology offered is palm-based liquid shortening formulation and its application in moon cake production. This palm-based liquid shortening can extend the shelf life of the product and maintain its freshness. It has longer induction time and better stability than That of commercial soyabean-based liquid shortening. No additional antioxidant is required in palm-based liquid shortening.

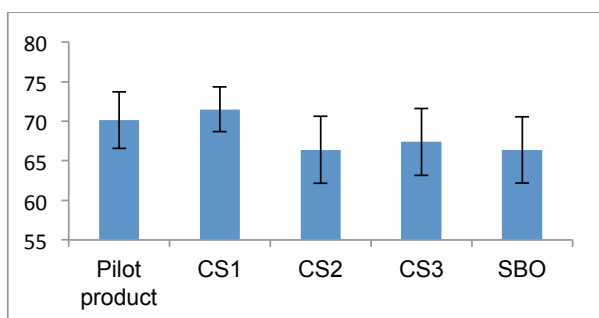


Figure 1. Sensory evaluation of moon cakes made from various liquid shortenings.

Note: Pilot product is palm-based liquid shortening; CS1, CS2, CS3: Commercial soyabean-based shortening samples; SBO: Soyabean oil-based liquid shortening (Control).

For the sensory evaluation and oil return rate, palm-based liquid shortening showed comparable, if not better results as compared to other liquid shortening products (Figure 1 and Table 1).

INGREDIENT AND PROCESSING

The main components of liquid shortening are vegetable oils, emulsifiers, essence, carotene and antioxidants. The palm-based liquid shortening was formulated by direct blending method.

PRODUCT CHARACTERISTICS

No additional antioxidant is required in palm-based liquid shortening. The moon cakes made with palm-based liquid shortening have good sensory quality and high oil return rate.

NOVELTY

PMF, a by-product from fractionation process is used to formulate liquid shortening for moon cake crust.



Figure 2. Palm-based liquid shortening.

TABLE 1. OIL RETURN RATE OF DIFFERENT LIQUID SHORTENINGS (%)

	PO	SBO	CS1	CS2	CS3
Oil Return Rate (%)	9.118±0.309a	8.675±0.597a	8.749±0.521a	9.301±0.550a	9.590±0.356a

TABLE 2. ESTIMATED EXPENDITURE AND ECONOMIC VALUES

Item	Value
Capital asset	RMB 450 000 (RM 276 343.73)
Benefit to cost ratio	1.11
Payback period, (yr)	3
Internal rate of return (IRR),%	47.48
Net present value (NPV) @ 10%	RMB 1 005 749 (RM 617 600.71)
Return on investment (ROI),%	33.3%

BENEFITS

Cost effective ingredient, enhanced oxidative stability and increased oil return rate.



Figure 3. Moon cakes made by palm-based liquid shortening.

MARKET POTENTIAL

In 2016, China's moon cake sales were recorded at 270 000 t which valued at RMB 13.5 billion. Demand for moon cakes is expected to increase by 5%-10% in the next few years. It is estimated that 8000 t of liquid shortening will be used in moon cake crust per year (China Leading Institute of Industry Research, 2016).

ECONOMIC EVALUATION

The investment for the production of palm-based liquid shortening is financially feasible as shown in Table 2. The estimated total investment is RMB 1 517 850 (RM 932 094.13) with capital expenditure of approximately RMB 450 000 (RM 276 343.73). The parameters shown are evaluated based on the price of liquid shortening at RMB 14 000 t⁻¹ (approximately RM 8597.95 t⁻¹) The investment will generate an income of RMB 1 820 000 (RM 1 117 694.05) after three years.

CONCLUSION

Palm olein can replace soyabean oil in liquid shortening for moon cake production. Palm-based liquid shortening has better oxidative stability than that of soyabean oil. The moon cakes made of palm-based liquid shortening have good sensory quality and fast oil return rate.

REFERENCES

China Leading Institute of Industry Research (2016). <http://bg.qianzhan.com/report/detail/9674c7c0ea4842bd.html>, accessed on 6 February 2018.

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