

PALM-BASED LIQUID CHOCOLATE FILLING FOR CONTEMPORARY MOONCAKES

NIU YUETING; YOONG JUN HAO; INSYIRAH MOHAMAD SHAH and SUBASHINI NADRAS



MPOB INFORMATION SERIES • ISSN 1511-7871 • JULY 2020

MPOB TT No. 674

Mooncake is one of the most consumed bakery products in the world, including China (Chen *et al.*, 2019). Due to China's influence, mooncakes and Mid-Autumn Festival are also enjoyed and celebrated in other parts of Asia. Mooncakes have also appeared in western countries as a form of delicacy.

Today, it is customary for businessmen and families to present them to their clients or relatives as presents, and this helps to fuel a demand for high-end mooncakes. China recorded a total sale of 1.38 billion mooncakes worth RMB19.67 billion in 2019 (China Food Industry Association, 2019). The entire industry also showed an upward trend with a 7.9% growth rate.

Due to a commercial need to drive up sales in the face of intense competition in the food industry, the Chinese market is currently diversifying from traditional mooncakes to contemporary mooncakes, which require new type of filling, replacing the conventional bean paste. These trends are also to cater to changing taste preferences and to adapt to the more health-conscious society.

Liquid chocolate filling is one of the new filling fats introduced into the bakery industry where the

chocolate remains at liquid state even after baking process. The liquid chocolate filling can be applied in the various bakeries including cookies, biscuits and breads.

This paper introduces the formulation for liquid chocolate filling for the production of contemporary mooncakes.

THE TECHNOLOGY

Technologies offered are the formulation of liquid chocolate filling fat, the method for production and baking of the mooncake, which includes methods to avoid fat migration. The chocolate filling fat remains in liquid state at room temperature during and even after the baking of mooncakes. This will enable a smooth texture and mouthfeel chocolate filling with a flaky exterior. In addition, the technology helps prevent the breaking, leaking and changing of the mooncake shapes despite having liquid and soft inner filling.

The product characteristics of contemporary mooncakes after seven days of storage *i.e.* hardness, chewiness, compactness and oil return rate were analysed and are listed in *Table 1*. The sensory evaluation of contemporary mooncakes showed good preferences compared to the commercial mooncakes (*Table 2*).

TABLE 1. CHARACTERISTICS OF CONTEMPORARY MOONCAKES WITH PALM-BASED LIQUID CHOCOLATE FILLING

Parameters	Values
Storage time	7 days
Crust hardness (g)	644.761±11.91
Filling hardness (g)	371.709±10.611
Chewiness (g)	3,804.486±8.343
Compactness (g)	68.611±35.431
Oil return rate (%)	12.54±0.60

ISSN 1511-7871



9 771511 787001

Head of Corporate Implementation and Consultancy Unit, Malaysian Palm Oil Board. 6, Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia. Tel: 03-8769 4574 Fax: 03-8926 1337 E-mail: tot@mpob.gov.my Website: www.mpob.gov.my



TABLE 2. SENSORY PROPERTIES OF CONTEMPORARY MOONCAKES WITH LIQUID CHOCOLATE FILLING COMPARED TO COMMERCIAL MOONCAKES

Mooncake fillings	Mooncake shapes	Colour	Taste	Texture	Total score
Palm-based Liquid Chocolate Filling Fat	25.2±1.3	15.2±1.2	19.4±4.1	16.4±2.6	76.0±2.8
Commercial Product 1: Mix Nuts	21.3±3.9	18.5±2.1	22.5±4.5	18.0±1.2	80.3±2.3
Commercial Product 2: Sweet Bean Paste	23.8±3.4	16.0±1.2	21.3±2.6	17.8±1.1	78.8±2.2
Commercial Product 3: Black Sesame Paste	16.8±1.9	14.8±1.6	18.6±3.2	15.8±2.5	66.0±2.3
Commercial Product 3: Lotus Seed Paste	26.8±1.8	16.8±1.2	15.8±3.1	16.2±2.2	75.6±2.9

ADVANTAGES

- Higher value addition;
- New and contemporary product in the market, targeting the younger generation who loves confectionery products; and
- Innovation that combines traditional flaky crust with smooth and mouth-watering liquid chocolates.

NOVELTY OF THE PRODUCT

Mooncake with liquid chocolate filling fat. Typical mooncakes are round pastries with rich and thick filling, usually made from red bean or lotus seed

paste, is surrounded by a thin crust and may contain yolks from salted duck eggs.

ECONOMIC ANALYSIS

The investment in the production of moon cake is financially feasible as shown in *Tables 3 and 4*. The estimated total investment is RMB110 000 000 (RM66 015 219) with a capital asset of approximately RMB80 000 000 (RM48 011 068) for a new mooncake plant with 600 tonnes per annum production. While for existing plant, the total investment is RMB20 000 000 (RM11 996 886) with a capital asset of approximately RMB12 000 000 (RM7 201 660).



Figure 1. Moon cake product with chocolate filling fat.

**TABLE 3. ESTIMATED EXPENDITURE AND ECONOMIC VALUES
(for new mooncake plant)**

Item	Value
Capital asset	RMB12 000 000 (RM7 201 660)
Benefit to cost ratio	1.31
Payback period, (yr)	2
Internal rate of return (IRR), %	50.78
Net present value (NPV) @ 10%	RMB18 908 665 (RM11 347815)
Return of investment (ROI), %	20.3%

**TABLE 4. ESTIMATED EXPENDITURE AND ECONOMIC VALUES
(with modifications to the existing mooncake plant)**

Items	Value
Capital asset	RMB80 000 000 (RM48 011 068)
Benefit to cost ratio	1.30
Payback period, (yr)	3
Internal rate of return (IRR), %	43.15
Net present value (NPV) @ 10%	RMB111 454 386 (RM66 888 052)
Return of investment (ROI), %	24.09

The parameters shown below are evaluated based on the moon cake selling price of RMB140.00 kg⁻¹ (approximately RM84.00 kg⁻¹).

CONCLUSION

This innovation is currently at the forefront of the mooncake industry trend and the potential demand is promising. The formulation will allow the chocolate filling in mooncakes remain fluid,

while having flaky crust that brings an entirely new experience to eating mooncakes.

REFERENCES

- Chen Xuan; Zhang Yan and Deng Yuanyuan (2013). Research progress of low-calorie cantonese moon cakes. *J. Food Science and Technology*, 31(5): 55-62.
- China Food Industry Association (2019). (<https://www.iimedia.cn/c460/66179.html>)

For more information, kindly contact:

Head of Corporate Implementation
and Consultancy Unit, MPOB
6, Persiaran Institusi,
Bandar Baru Bangi,
43000 Kajang, Selangor, Malaysia
Tel: 03-8769 4574
Fax: 03-8926 1337
E-mail: tot@mpob.gov.my
www.mpob.gov.my