



Lassi is a popular traditional yogurt-based drink that is usually consumed during the summer. The sour and sweet taste of lassi makes it a refreshing drink. The high quality lassi has a smooth, yellowish-coloured texture and a creamy taste. Lassi is categorised as a low pH milk beverage (by fermentation and acidification), which is currently receiving more attention by the consumers.

Traditionally, lassi is made from pasteurised and standardised milk or part skim milk, and is cultured with lactic acid and aroma/flavour-producing organisms through a complex and time-consuming process. Consuming lassi made of full cream milk (3%-4% milk fat) can cause increased cholesterol levels in the human body. On the other hand, the healthier low-fat lassi has a poor consistency and flat flavour which shows excessive whey separation (Khurana and Kanawjia, 2007). Replacement of milk fat with palm oil to imitate full cream milk may overcome this problem.

In addition, the fermentation process of lassi takes at least 12 to 16 hr, where the quality is affected by the type and composition of the milk used, type of culture, temperature, incubation period and the

addition of sugar and/or salt. Breeding of bacterial cultures is an essential prerequisite for high quality lassi production. Direct acidification without the use of culture in the manufacture of lassi will not only address these problems (complex process and time consuming), but will also significantly reduce processing time and help in reducing the production costs. The direct acidification will also significantly extend the shelf life of lassi because it is not influenced by live culture.

Palm-based lassi through this direct acidification process is still not available or explored in the market. Thus, it has huge potential to be commercialised in the market at competitive price.

THE INVENTION

Palm-based lassi is more cost-effective and its production is less time consuming compared to fermented lassi. The physicochemical properties of palm-based lassi *i.e.* pH, titratable acidity, viscosity and Brix, are comparable to that of commercial lassi (Table 1). The sensory evaluation of palm-based lassi showed higher preferences than the commercial lassi (Table 2).

TABLE 1. COMPARISON OF PHYSICO-CHEMICAL PROPERTIES OF PALM-BASED LASSI AND COMMERCIAL LASSI

Formulation	pH	Titratable acidity (%)	Viscosity (Pa.s)	Brix (°B)
Palm-based lassi*	4.4	0.291 to 0.300	0.041 to 0.045	13.2 to 13.3
Commercial lassi	3.7	0.27	0.038	14.00

Note: * Analysis were carried out at Day 1, 7, 21, and 28 of storage.



TABLE 2. SENSORY PROPERTIES OF PALM-BASED LASSI COMPARED TO COMMERCIAL LASSI

Samples	Colour	Aroma	Sweetness	Sourness	Creaminess	Overall acceptance
Palm-based lassi	5.77 ± 1.43 ^a	5.53 ± 1.38 ^a	5.40 ± 1.07 ^a	5.17 ± 1.09 ^a	5.03 ± 1.38 ^a	5.43 ± 1.25 ^a
Commercial	3.13 ± 1.25 ^b	4.30 ± 1.66 ^b	5.23 ± 1.57 ^a	4.67 ± 1.81 ^a	4.37 ± 1.56 ^a	4.60 ± 1.61 ^a

TABLE 3. ECONOMIC VALUES OF PALM-BASED LASSI

Economic analysis	Value
Cost (materials), RM/ 200 ml	0.40
Selling price, RM/ 200 ml	2.00
Capital expenditure (including rental of building), RM	713 210
Net present value (NPV) at 10%, RM	3 996 267
Internal rate of return (IRR), %	64.74
Discounted payback period	2 yr 2 mth
Discounted benefit to cost ratio	1.48



Figure 1. Palm-based lassi.

ADVANTAGES

- Cost effective price for palm-based lassi.
- Reduced processing time.
- Utilisation of palm oil for higher value added products.
- Availability of palm-based lassi.

NOVELTY OF THE PRODUCT

Palm-based lassi through the acidification process.

ECONOMIC ANALYSIS

The estimated expenditure and other economic evaluation are shown in Table 3. This economic evaluation is based on the assumption that the

palm-based lassi drink is sold at RM 2.00 per bottle of 200 ml and consistent production capacity of 2 880 000 bottles/year (capacity utilisation from 20% to 60%, gradual increment in 10 years). Current price of commercial lassi drink is RM 2.25 to RM 2.50 per 200 ml. Target markets are small and medium enterprises (SME).

CONCLUSION

The palm-based lassi is a new type of beverage with high commercial potential in the local market. The product can be sold at a competitive price with better overall acceptance compared to the commercial lassi. In addition, its processing is simple and less time consuming.

REFERENCE

Khurana, H and Kanawjia, S K (2007). Recent trends in development of fermented milks. *Curr. Nutr. Food Sci.*, 3: 91-108.

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