PALM-BASED LIPSTICKS

by: ZAHARIAH ISMAIL

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Lipstick is intended to impart attractive colours, enhance the appearance of lips and hide any unattractive features such as very thick or very narrow lips (Cunningham, 1992). Besides its beauty, a lipstick can be made beneficial to the user if vitamins (A, B, E, *etc.*) or functionality ingredients are incorporated. The main components in a lipstick formulation are wax and oil. Currently, castor oil is used predominantly in lipstick formulation. Research in AOTC of MPOB has been carried out to substitute the castor oil with palm oil-based materials and incorporation of 51%-57% of palm-based materials has been achievable. To add value, the formulae are enriched with vitamins A and E and goat's milk cream.

CONSUMER EXPECTATION

A lipstick should apply easily, give good colour coverage, yet look natural. It should feel moist, not dry and should not bleed (flow) into the lines around the mouth. It should not change colour during wear and should have acceptable flavour and/or fragrance (deNavarre, 1978). After ease of use, colour is the most important criterion. A wide range of colours, in both cream and frost (or pearl), with varied shine levels from matte (dull) to cream (soft shine) to glossy (high shine) is essential. Each colour integrates the fashion trend of the season. At present, the soft, cream and pearl, *luscious* look on a woman's lips has definitely become a trend. Probably, the ad agencies would describe this as the *wet sexy* look.

LIPSTICK MANUFACTURE

The manufacture of lipstick involves three main operations:

a. Dispersion of dyes and pigments by milling;
b. Blending of the pigment/dye dispersion into the constituent oils and waxes;
c. Moulding; and
d. Flaming.

The six most important lipstick base materials, excluding colourants, preservative and fragrance are: beeswax, candelilla wax, carnauba wax, castor oil, lanolin and ozokerite. Larger amounts of beeswax and carnauba wax have the tendency to produce granular mass, poor luster lipsticks. Castor oil is not compatible with a hydrocarbons and large percentages tend to leave thick, greasy films with a characteristic taste on application. Because of this, the recommended level of castor oil to be used in lipstick is 25%-50% (deNavarre, 1975). However, it is observed that some lipsticks on the market do contain as high as 65% castor oil.

Lipstick technology is an exciting and challenging technology. A good lipstick has to fulfil several requirements (deNavarre, 1975; Harry, 1962).

a. Good shape;
b. Apply smoothly (with no drag when the product is applied to the lips);
c. Feel comfortable on the lips (without being greasy);
d. The colour must be permanent on the lips but capable of being readily removed when desired;
e. Must not sweat, crumble or cake;
f. Moisturizing and softening;
g. Should not change colour after application; and
h. Give a clear non-feathering outline.

For a satisfactory shelf-life, the product should have little tendency to dry out, harden or become brittle on ageing, which would cause it to crumble during application. It should melt at a sufficiently high temperature to avoid excessive softening in warm conditions leading to loss of shape and smearing, and yet not harden too much during cold weather for application to become difficult. Blends of hard waxes with a high melting point and fluid oils can attain good thixotropic mixtures giving rise to lipsticks with the desired properties described above (Jo Smewing,1978).

There are several tests to evaluate the performance of a lipstick and among them are:

a. Softening point and dropping point, measured using the Mettler instrument (Manoel Carames *et al.*, 1978);
b. Lipstick hardness, measured by a Penetrometer (DIN

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Malaysian Palm Oil Board, Ministry of Primary Industries, Malaysia
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-89259155, 89259775, Homepage: http://mpob.gov.my Telefax: 03-89259446

5179, ASTM Standard Method of Test D 1321-57 T and D937-58);

c. Lipstick breakage, measured by the breaking point balance (Manoel Carames *et al.*, 1978);
d. High humidity test, by storage at 45°C for three months (Manoel Carames *et al.*, 1978); and
e. Heat test or heat stability, by keeping the lipstick at 55°C for a minimum period of 24 hr (Fishbach, 1954).

AOTC MPOB has carried out some study to substitute castor oil with palm-based materials. The amount of palm-based materials that can be incorporated into lipstick, with an acceptable characteristic taste on application, ranges from 51% to 57%. Besides taste, other parameters were also used to evaluate the characteristics of palm-based lipsticks and these are compared to commercial samples (COM) and lipsticks-based on castor oil (CO). Palm-based lipsticks were found to be comparable and some of the collaborators have requested AOTC to formulate lipsticks for them. This paper discusses two ranges of lipstick formulations to be transferred to two collaborators for commercialization.

MILLENNIUM CARE PALM-BASED LIPSTICKS

To capture a niche market, the lipsticks formulated for Geena Classic Beauty Saloon are enriched with palm-based vitamins A and E. The lipsticks are available in seven shades to reflect personality, occasion and the fashion trend. All shades are suitable for all age groups (*Figure 1*). The profiles of Millennium Care palm-based lipstick are shown in *Figures 2,3,4* and *Table 1*.

The softening point indicates the temperature at which the lipstick will not melt at high temperature. It should be resistant to varying temperatures and be just as easy to apply in hot as in cold weather. *Figure 2* indicates that all the lipsticks formulated for Geena Classic had softening points comparable to COM and CO.

The dropping point indicates the temperature at which the first drop forms from the melted sample.The higher the dropping point the better it is and indicates the ability to withstand a hot climate.

Figure 3 indicates that with the same formulation, changing the colourant used will have a dramatic effect on the

Figure 1. Millennium Care lipsticks.

properties of the lipstick. This is due to the differences in the oil absorbency of the colourants (Fishbach, 1954). Each colour varies considerably in its wetting and dispersion characteristics. Shades 3, 4 and CO show a higher dropping point than the others due to the high percentage of metallic colours in the lipstick formulation.

The depth that a specific-sized needle can penetrate into the lipstick is used as a measure of hardness. The deeper the penetration, the softer is the lipstick. *Figure 4* indicates that Millennium Care lipsticks have a hardness similar to COM and CO.

The breaking point is to check the break strength of the lipstick itself. This is because women apply lipstick with varying degrees of force. Results indicate passes which show that the lipsticks will not bend, crumble, crack or break during application.

The heat test measures the time taken for the lipstick to distort or bend with heat. Although the time taken by the lipsticks differed greatly, all the lipsticks retained their shapes when placed in a lady's handbag for more than one year.

The high humidity test is used to see whether the lipstick will sweat or bleed when placed in the desiccator containing water and kept constant at 45°C for three months. If no sweating or bleeding is seen after three months under the above conditions, the lipstick passes

TABLE 1. PHYSICAL PROPERTIES OF MILLENNIUM CARE LIPSTICK

Evaluation	Shade1	Shade2	Shade3	Shade4	Shade5	Shade6	Shade7	COM	CO
Breaking point	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Heat test (stick drop or distortion)	80 min	48 min	3 days	3 days	48 min	80 min	425 min	90 min	3 days
High humidity test	*nsb	nsb	nsb	nsb	nsb	nsb	nsb	nsb	nsb

Note: * nsb = no sweating and bleeding

TABLE 2. PHYSICAL PROPERTIES OF HR LIPSTICK WITH GOAT'S MILK

Evaluation	Shade1	Shade2	Shade3	Shade4	Shade5	COM	CO
Breaking point	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Heat test (stick drop or distortion)	50 min	50 min	65 min	90 min	90 min	90 min	3 days
High humidity test	nsb	nsb	nsb	nsb	nsb	nsb	nsb

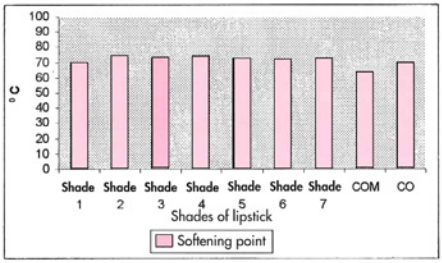

Figure 2. Softening point of Millennium Care lipstick.

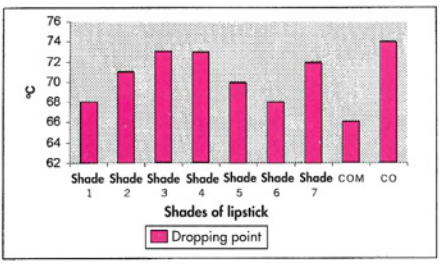

Figure 3. Dropping point of Millennium Care lipstick.

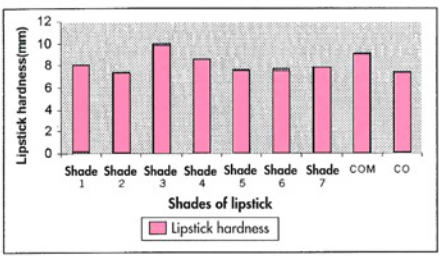

Figure 4. Lipstick hardness of Millennium Care lipstick.

the test. All the lipstick studied passed the sweating and bleeding test.

Unique characteristics of Millennium Care lipsticks:

a. Incorporate 57% of palm-based material;
b. Rich in natural pro-vitamins A and E; and
c. Good quality lipsticks with brilliant surfaces.

HR PALM-BASED LIPSTICKS

HR Marketing Sdn. Bhd. markets cosmetic and personal care products containing goat's milk as the functionality ingredient. The lipsticks formulated for HR Marketing Sdn. Bhd. are enriched with goat's milk cream, which is high in vitamin B-6, vitamin A, potassium and selenium. Inorganic ingredients for UVA and UVB filters are also incorporated in HR lipsticks thereby enhancing the functionality of the lipsticks. The five shades of lipsticks are formulated to reflect different personalities, occasions and fashion trends. All the shades are suitable for all age groups (*Figure 5*). The profiles of HR palm-based lipstick are shown in *Figures 6,7,8* and *Table 2*. For the heat test - shades 1,2 and 3 were below COM and CO. Although the time taken by the lipsticks differed greatly, all the lipsticks retained their shapes when placed in a lady's handbag for one year.

Figure 5. HR lipsticks with goat's milk cream.

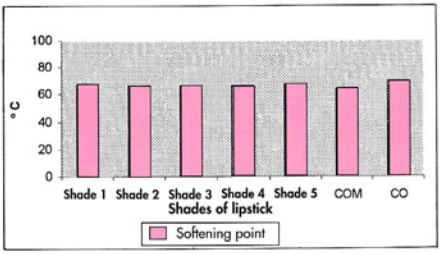

Figure 6. Softening point of HR lipstick with goat's milk cream.

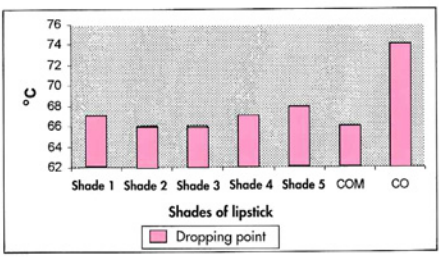

Figure 7. Dropping point of HR lipstick with goat's milk cream.

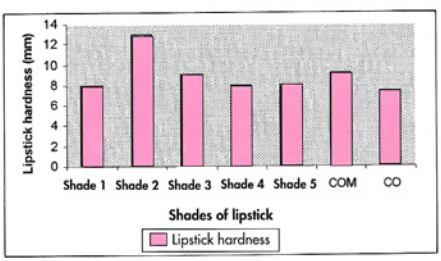

Figure 8. Lipstick hardness of HR lipstick with goat's milk cream.

Unique characteristics of HR palm-based lipsticks:

a. Incorporate 51% of palm-based materials;
b. Contain goat's milk and are therefore rich in vitamin B-6, vitamin A, potassium and selenium;
c. They have SPF values ranging from 4 to 9; and
d. Good quality lipsticks with brilliant surfaces.

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For more information kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-89259155, 89259775,
Homepage: http://mpob.gov.my
Telefax: 03-89259446