

The most common problem associated with shaving is skin irritation, which includes nicks and cuts. Some skin irritation is unavoidable because of the removal of some stratum corneum along with removal of beard hair. Therefore, palm vitamin E (tocotrienol-rich product) is incorporated into shaving lather formulations to reduce skin inflammation and irritation and to reduce the amount of water loss from the skin surface.

## SHAVING LATHERS WITH PALM VITAMIN E

Palm vitamin E from two different sources, namely, Tocomin and Gold Tri-E, is incorporated into the shaving lather formulations. Tocomin was obtained from Carotech Sdn Bhd while Gold Tri-E was obtained from Sime Darby Bioganics Sdn Bhd. Shaving lathers with palm vitamin E have a pH range from 5.5 to 6.0, which is compatible to the pH of the skin. A storage study at room temperature, freeze/thaw cycles and at 45°C showed that the products were stable after 12 months. Product appearance for the shaving lather with Tocomin is deep orange due to the presence of carotenoids in Tocomin, while the shaving lather with Gold Tri-E is yellowish as shown in Figures 1(a) and (b), respectively.

### SAFETY EVALUATION (In Vitro Dermal Irritation Assay)

Shaving lathers with palm vitamin E were evaluated by the dermal irritation assay to predict their potential in causing dermal irritation. The dermal irritation assay results indicate that shaving lathers with palm vitamin E were classified as non-irritants (Figure 2).

### EFFICACY EVALUATION (REPEATED WASH TEST)

A total of 20 volunteers; 10 females and 10 males, aged between 23 and 52 years (average age: 36.2 years), with good health and free from skin diseases, participated in the study. Each subject's forearm was washed with the products and tap water (wet control) four times a day for four consecutive days, and only twice on the fifth day. The final skin condition was evaluated on the fifth day by measuring transepidermal water loss (TEWL), skin pH and skin redness.

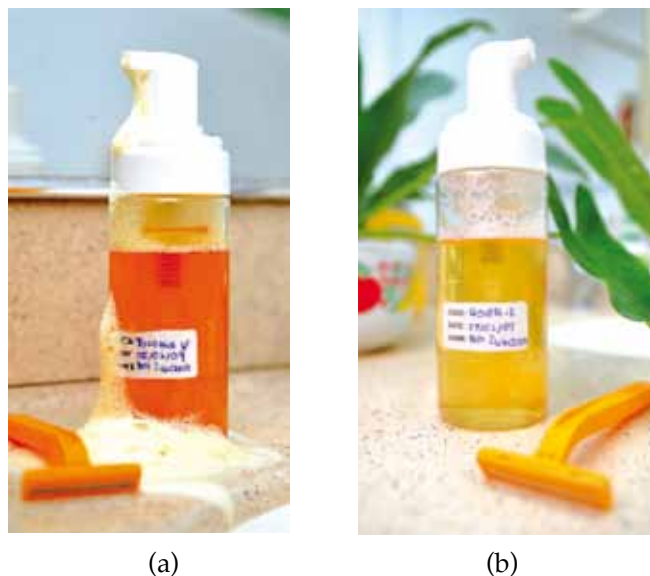


Figure 1. Shaving lathers with (a) Tocomin and with (b) Gold Tri-E.

Tables 1, 2, and 3 show the mean, standard deviation, percent of variation and significance level from analyses of variance on data for transepidermal water loss (TEWL), skin pH, and skin redness (parameter a\*) in the skin areas treated with a shaving lather placebo, shaving lather with Tocomin, shaving lather with Gold Tri-E, a wet control and an untreated area (dry control). Analyses of variance did not detect significant differences in the data for transepidermal water loss (TEWL), skin pH and skin redness, having a probability  $P > 0.05$ .

Figures 3, 4, and 5 show the average results of initial (basal) and final readings of transepidermal water loss (TEWL), skin pH and skin redness, respectively. Based on Figure 3, the results indicate that skin treated with the test products demonstrated an increase in TEWL. However, the percentage of variation for shaving lather with Tocomin (18.92%) and shaving lather with Gold Tri-E (15.63%) were lower than for the shaving lather placebo (20.67%). This means that less water evaporated from the skin applied with shaving lathers with palm vitamin E than when using normal shaving lather (placebo).

Skin redness results for skin treated with shaving lather with Tocomin and shaving lather with Gold Tri-E indi-



### In vitro Dermal Irritation Assay

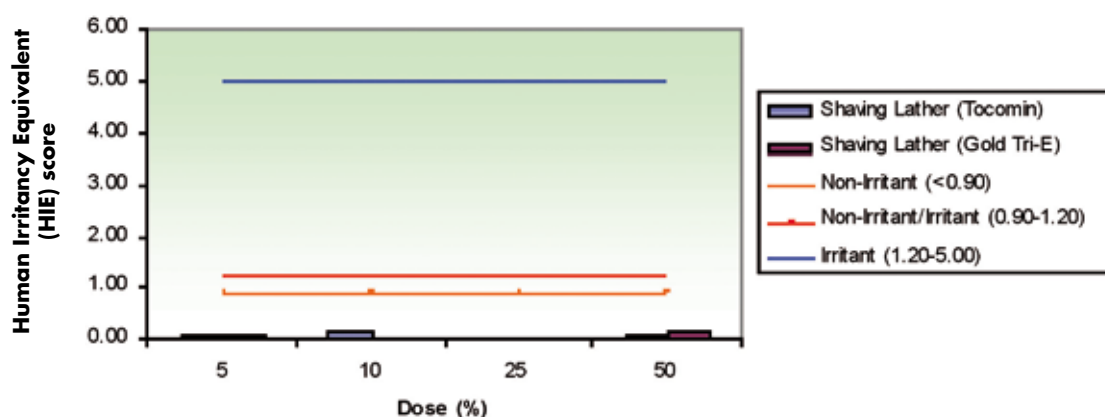


Figure 2. In vitro dermal irritation assay of shaving lathers.

**TABLE 1. MEAN, STANDARD DEVIATION (S.D.), PERCENT OF VARIATION (% VAR.) AND SIGNIFICANCE LEVEL FROM ANALYSIS OF VARIANCE (ANOVA) ON DATA FOR TRANSEPIDERMAL WATER LOSS (TEWL)**

Transepidermal water loss (TEWL)										
	Shaving lather placebo		Shaving lather with Tocomin		Shaving lather with Gold Tri-E		Wet control		Dry control	
	Basal	Final	Basal	Final	Basal	Final	Basal	Final	Basal	Final
Mean	7.70	9.29	7.66	9.11	7.59	8.77	7.79	7.65	8.69	8.40
S.D.	1.33	2.25	1.42	2.23	1.39	2.30	1.47	1.08	1.53	1.49
% var.	20.67		18.92		15.63		-1.73		-3.29	
<b>ANOVA</b>	<b>P &gt; 0.05</b>									

**TABLE 2. MEAN, STANDARD DEVIATION (S.D.), PERCENT OF VARIATION (% VAR.) AND SIGNIFICANCE LEVEL FROM ANALYSIS OF VARIANCE (ANOVA) ON DATA FOR SKIN PH**

Skin pH										
	Shaving lather placebo		Shaving lather with Tocomin		Shaving lather with Gold Tri-E		Wet control		Dry control	
	Basal	Final	Basal	Final	Basal	Final	Basal	Final	Basal	Final
Mean	6.7	7.4	6.7	7.5	6.6	7.5	6.6	7.3	6.6	7.0
S.D.	0.9	0.3	0.9	0.3	0.9	0.3	0.9	0.6	0.9	0.9
% var.	11.9		12.9		13.4		9.6		5.0	
<b>ANOVA</b>	<b>P &gt; 0.05</b>									

**TABLE 3. MEAN, STANDARD DEVIATION (S.D.), PERCENT OF VARIATION (% VAR.) AND SIGNIFICANCE LEVEL FROM ANALYSIS OF VARIANCE (ANOVA) ON DATA FOR SKIN REDNESS (PARAMETER A\*)**

Skin redness (parameter a*)										
	Shaving lather placebo		Shaving lather with Tocomin		Shaving lather with Gold Tri-E		Wet control		Dry control	
	Basal	Final	Basal	Final	Basal	Final	Basal	Final	Basal	Final
Mean	14.79	15.26	14.72	14.95	14.72	14.94	14.58	15.02	13.88	14.28
S.D.	2.10	1.38	2.08	1.56	1.95	1.39	2.11	1.55	1.89	1.23
% var.	3.18		1.53		1.54		3.08		2.90	
<b>ANOVA</b>	<b>P &gt; 0.05</b>									

cated a lower % variation with 1.53% and 1.54% respectively, than shaving lather placebo (3.18%) as shown in Figure 5. Therefore, incorporation of palm vitamin E in shaving lather formulations helps to reduce skin inflammation and irritation.

In general, the results show that there were no significant difference for skin pH, TEWL and skin redness, thus the test products may not induce skin irritation even after prolonged exposure.

### SENSORIAL EVALUATION

The ideal properties for shaving products are: The product must foam quickly and copiously, and must be stable enough to last throughout the shaving process. The foams must surround, separate and hold the hairs. In addition, the product should soften and swell the hairs, and lubricate the skin to reduce blade resistance thus preventing razor burn. As with other cosmetic products, it must be non-irritating to the skin, and should have a pleasant fragrance.

A panel of 10 assessors (males) was asked to rate the product properties in terms of product colour/appearance, foam appearance, smoothness, adhesiveness/foam stability, after-feel and fragrance using a 1 - 5 scale, ranging from: dislike (1) to like (5).

Figure 6 shows the results of the sensorial evaluation. All product properties for the shaving lather placebo, shaving lather with Tocomin and shaving lather with Gold Tri-E had mean scores above 3.5 except for product colour/appearance, for which the shaving lather with Tocomin had the lowest score (2.9) due to its deep orange colour.

### MARKET ANALYSIS

Men are not traditionally known for their use of cosmetics and toiletries in Malaysia. However, with awareness and greater exposure to western trends, Malaysian males have demonstrated a rising interest in products specifically developed for their use in 2006 (Figure 7). Men's grooming products have shown significant growth as men become more aware of the benefits offered by such products.

With the improvement in the standard of living, men are paying more attention to personal grooming products. Malaysia is becoming more and more urbanized and people are paying more attention to their well-being and physical appearance. Hence, men's grooming products are expected to enjoy a healthy compound annual growth rate (CAGR) of 5% in constant value terms to reach a value of more than RM 260 million in 2009.

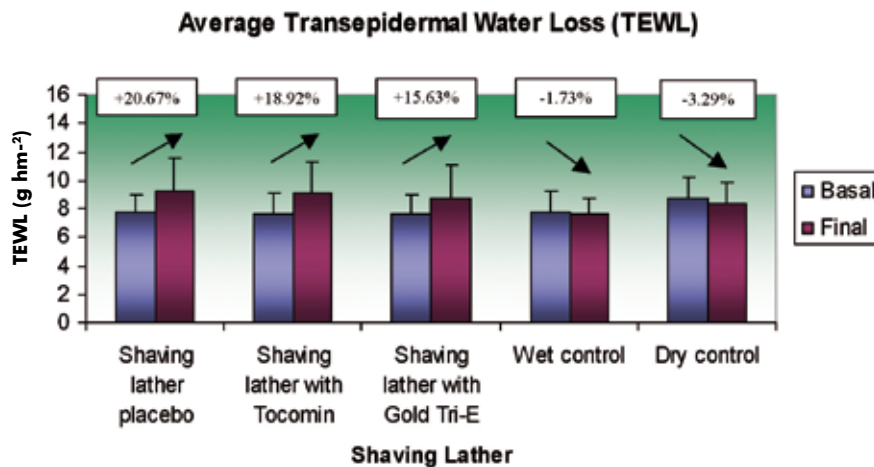


Figure 3. Average transepidermal water loss (TEWL) measurements.

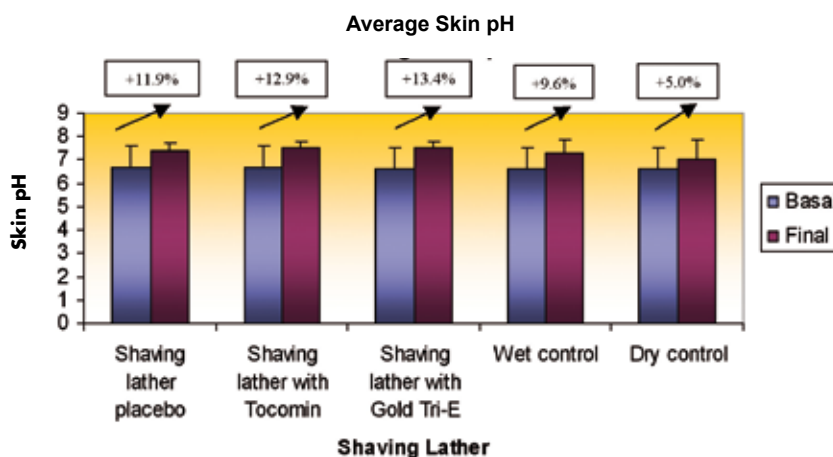


Figure 4. Average results of skin pH measurements.

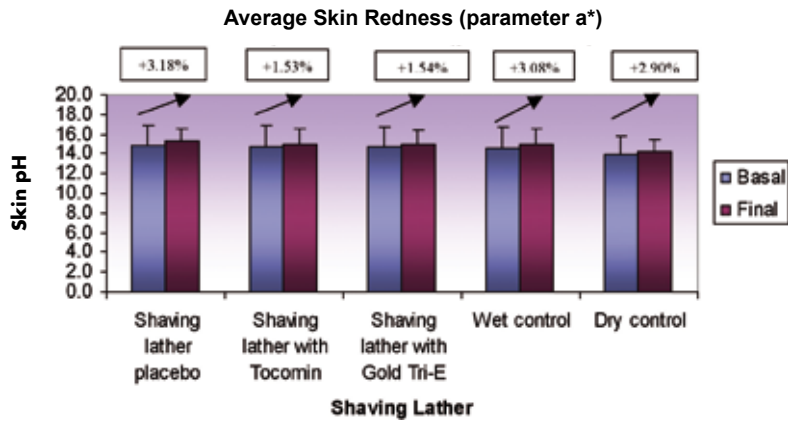


Figure 5. Average of skin redness (parameter a\*).

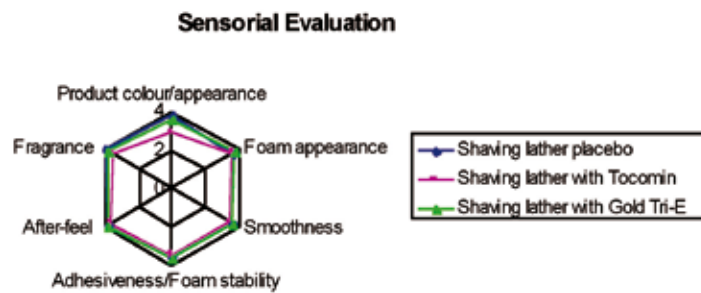


Figure 6. Sensorial evaluation of shaving lathers.



Source: Euromonitor estimates.

Figure 7. Forecasted sales of men's grooming products by sector value 2007-2009.

## ECONOMIC ANALYSIS

Internal rate of return (IRR) = 26%  
 Payback period = 4 years  
 Net present value (NPV) @ 20% = RM 48 000.00  
 Estimated selling price = RM 16.20/200 ml  
 Capital Expenditure (CAPEX) = RM 57 000.00

## CONCLUSION

Shaving lathers with palm vitamin E were evaluated by the dermal irritation assay and the results indicate that the shaving lather with Tocomin and the shaving lather with Gold Tri-E were classified as non-irritants. Repeated wash tests carried out on 20 volunteers indicate that prolonged repeated applications of the products did not induce any adverse effect on the skin. The

transepidermal water loss, skin redness and skin pH data indicated that the products within normal range of application are safe to be used by the consumer.

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