

APPENDIX A

PREPARATION OF 10% OF SODIUM HYDROXIDE SOLUTION

Source of sodium hydroxide is from Poland with 100% concentration. 10 grams of sodium hydroxide was dissolved in 90 grams of deionised water.

1 molar of NaOH = 40 gm/liter or 40 gm/1000 ml.

$$\begin{aligned}\text{Therefore, } 10 \text{ gm}/100 \text{ ml} &= \frac{(10 \text{ gm}/100 \text{ ml})}{(40 \text{ gm}/1000 \text{ ml})} \times 1 \text{ M} \\ &= 2.5 \text{ M}\end{aligned}$$

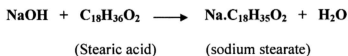
pH of this solution is 13.46.

APPENDIX B

CALCULATION OF SODIUM STEARATE FORMED IN MOISTURISER PRODUCT

Stearic acid used is a cosmetic grade from Henkel KgaA, Germany (Edenor STIMY). Its saponification value is in the range of 206 to 214. For the calculation, the saponification value is taken as 210. Stearic acid used in the moisturiser product formulation is 3wt/wt% or 3 grams/100 grams of moisturiser product developed.

Reaction to form sodium stearate is as follows:



Definition of Saponification Value

Saponification value is the number of 100% KOH to saponify 1 gram of stearic acid.

Therefore, the actual amounts of KOH required per 100 parts of stearic acid is

$$\begin{aligned} &= \frac{\text{saponification value}}{1000} \times \frac{\text{molecular weight of NaOH}}{\text{molecular weight of KOH}} \times 100 \\ &= \frac{210 \text{ mg KOH}}{1 \text{ gram stearic acid}} \times \frac{1 \text{ gram stearic acid}}{1000 \text{ mg stearic acid}} \times \frac{40}{56.1} \times 100 \\ &= 14.97 \text{ grams of NaOH} \end{aligned}$$

This means, 100 grams of stearic acid will require 14.97 grams of NaOH (100% concentration) to be saponified. From the formulation, 3 wt/wt% of stearic acid was used. Thus, to 100% saponify this stearic acid to form sodium stearate, the amount of NaOH (100%) required is (3/100 x 14.97 gram NaOH) or 0.4491 gram NaOH. Therefore, 3 grams of stearic acid will need 0.4491 grams of 100% concentration of NaOH. So for 10% solution of NaOH was used in the formulation, this means

$$= \frac{100\%}{10\%} \times 0.4491 \text{ grams}$$

$$= 4.491 \text{ grams of NaOH}$$

So, 3 grams stearic acid will require 4.491 grams of NaOH (10% solution) to form sodium stearate 100%. If 1.05 gm NaOH (10% solution) is used in the product formulation, this means $1.05 \text{ gm} / 4.491 \text{ gm} \times 3 \text{ gm stearic acid} = 0.7014 \text{ gm}$ of stearic acid is reacted to form sodium stearate. Thus, there will be $(3 \text{ gm} - 0.7014 \text{ gm} = 2.2986 \text{ gm})$ or 76.62% excess of stearic acid not reacted.

APPENDIX C

VISCOSITY PROFILE FOR MOISTURISER BASE PRODUCT

Table C.1 Viscosity Profile for Moisturiser Base Product Formulations at 50°C, 0.1288 s⁻¹

Formulation Code	B1	B2	B3	B4	B5	B6	B7	B8
wt/wt% NaOH	0.5	0.55	0.6	0.65	0.75	0.85	0.95	1.05
Wk 0	35538	36491	37103	38056	40451	45217	49353	52884
Wk 1	22063	23281	24402	25106	27993	33217	37513	41484
Wk 2	10413	11743	14578	18635	23562	26516	31106	34351
Wk 3	9325	10889	11689	14454	17837	21356	24959	31778
Wk 4	7315	8485	9664	11759	13817	15576	20245	26098
Wk 5	5889	6351	7015	7987	9564	10476	14509	22084

Note: The darker shaded showed the physical separation occurred in two layers and the lighter shaded showed the physical separation occurred into 3 layers.

APPENDIX D

COLOUR PROFILE FOR MOISTURISER BASE PRODUCT AT 50°C

Table D.1 Moisturiser Base Formulation – Colour Profile for Stability Test at 50°C

Formulation	B1	B2	B3	B4	B5	B6	B7	B8
% NaOH	0.5	0.55	0.6	0.65	0.75	0.85	0.95	1.05
Wk 0	MW	MW	MW	MW	MW	MW	MW	MW
L	93.08	93.11	93.16	93.21	93.29	93.37	93.43	94.03
a	-0.71	-0.73	-0.74	-0.76	-0.77	-0.79	-0.80	-0.85
b	0.41	0.42	0.43	0.45	0.49	0.52	0.55	0.39
Wk 1	MW	MW	MW	MW	MW	MW	MW	MW
L	93.14	93.18	93.22	93.27	93.35	93.44	93.57	94.08
a	-0.73	-0.75	-0.76	-0.77	-0.78	-0.83	-1.00	-1.04
b	0.42	0.44	0.46	0.48	0.51	0.63	1.26	1.25
Wk 2	MW	MW	MW	MW	MW	MW	MW	MW
L	N/A	N/A	93.29	93.37	93.42	93.55	93.75	94.15
a			-0.78	-0.80	-0.81	-0.91	-1.15	-1.17
b			0.49	0.53	0.59	1.11	1.77	1.77
Wk 3	MW	MW	MW	MW	MW	MW	MW	MW
L	N/A	N/A	N/A	93.43	93.52	93.63	93.77	94.16
a				-0.82	-0.89	-1.11	-1.17	-1.23
b				0.61	1.07	1.54	1.82	2.11
Wk 4	MW	MW	MW	MW	MW	MW	MW	MW
L	N/A	N/A	N/A	N/A	93.61	93.72	93.82	94.18
a					-1.07	-1.13	-1.22	-1.28
b					1.41	1.63	2.16	2.53
Wk 5	MW	MW	MW	MW	MW	MW	MW	MW
L	N/A	N/A	N/A	N/A	N/A	N/A	93.86	94.23
a							-1.27	-1.30
b							2.46	2.74

Note: The darker shaded showed the physical separation occurred in 2 layers and the lighter shaded showed the physical separation occurred into 3 layers.

MW – Milk White

N/A means not applicable.

APPENDIX E

MOISTURISER CONTAINING *Baccaurea motleyana hook f.* FRUIT'S EXTRACT (VISCOSITY PROFILE AT 50°C)

Table E.1 Viscosity Profile for Moisturiser Product Containing *Baccaurea motleyana hook f.* Extract at 50°C, Measured at 0.1288 s⁻¹

Formulation Code	B8	MR1	MR2	MR3	MR4	MR5
% Rambai Extr.	0	10	13	15	17	20
Wk 0	52884	43004	40877	38980	36229	32063
Wk 1	41484	30893	28456	26348	23279	18563
Wk 2	34351	27653	25732	23578	19623	15314
Wk 3	31778	24871	22389	19864	16548	12048
Wk 4	26098	21685	19637	16217	14589	10573
Wk 5	22084	19418	17157	14638	10968	7967

Note: The shaded column showed a 2 layer product's physical separation has occurred.

APPENDIX F

MOISTURISER CONTAINING *Baccaurea motleyana hook f.* FRUIT'S EXTRACT - COLOUR PROFILE AT 50°C

Table F.1 Moisturiser Containing *Baccaurea motleyana hook f.* Extract
– Colour Profile at 50°C

Formulation Code	B8	MR1	MR2	MR3	MR4	MR5
% Rambai Extr.	0	10	13	15	17	20
Wk 0	milk white	white	white	white	off white	off white
L	94.03	93.12	92.96	92.80	92.63	91.84
a	-0.85	-0.55	-0.61	-0.69	-0.78	-0.36
b	0.39	3.53	3.81	3.77	3.74	4.10
Wk 1	milk white	white	white	white	off white	off white
L	94.08	92.96	92.86	92.69	92.55	91.61
a	-1.04	-0.59	-0.66	-0.72	-0.82	-0.45
b	1.25	4.14	3.77	3.72	3.70	4.04
Wk 2	milk white	white	white	white	off white	off white
L	94.15	92.81	92.75	92.54	92.50	91.43
a	-1.17	-0.61	-0.69	-0.76	-0.86	-0.63
b	1.77	4.03	3.74	3.68	3.64	3.96
Wk 3	milk white	white	white	white	off white	off white
L	94.16	92.73	92.61	92.48	92.43	Not
a	-1.23	-0.65	-0.73	-0.82	-0.89	Applicable
b	2.11	3.95	3.70	3.64	3.60	
Wk 4	milk white	white	white	white	off white	
L	94.18	92.64	92.50	92.40	92.37	Not
a	-1.28	-0.68	-0.76	-0.86	-0.93	Applicable
b	2.53	3.91	3.64	3.59	3.55	
Wk 5						
L	94.23	92.56	92.45	92.36	Not	Not
a	-1.30	-0.72	-0.79	-0.89	Applicable	Applicable
b	2.74	3.87	3.61	3.57		

Note: The shaded column showed a 2 layer product's physical separation has occurred.

APPENDIX G

BUFFERED MOISTURISER CONTAINING *Baccaurea motleyana hook f.* FRUIT'S EXTRACT – COLOUR PROFILE AT 50°C

Table G.1 Colour Profile For Buffered Moisturiser Product Containing
Baccaurea motleyana hook f. Fruit's Extract At 50°C

Formulation Code	BR1	BR2	BR3	BR4
wt/wt% Rambai Extr.	17	20	23	25
Wk 0				
L	92.79	91.98	90.83	90.65
a	-0.63	-0.21	-0.35	-0.47
b	3.86	4.17	4.73	4.70
Wk 1				
L	92.70	91.90	90.75	90.58
a	-0.67	-0.24	-0.39	-0.51
b	3.84	4.10	4.69	4.64
Wk 2				
L	92.62	91.84	90.68	90.50
a	-0.69	-0.29	-0.43	-0.55
b	3.80	4.04	4.62	4.58
Wk 3				
L	92.58	91.78	90.60	Not
a	-0.73	-0.32	-0.46	Applicable
b	3.75	4.00	4.58	
Wk 4				
L	92.51	91.70	Not	Not
a	-0.76	-0.35	Applicable	Applicable
b	3.70	3.95		
Wk 5				
L	92.46	91.65	Not	Not
a	-0.79	-0.39	Applicable	Applicable
b	3.64	3.90		

Note: The shaded column showed a 2 layer product's physical separation has occurred.

APPENDIX H

VISCOSITY PROFILE FOR BUFFERED MOISTURISER PRODUCT CONTAINING *Baccaurea motleyana hook f.* FRUIT'S EXTRACT

Table H.1 Viscosity Profile for Buffered Moisturiser Product Containing *Baccaurea motleyana hook f.* Fruit's Extract measured at 0.1288s⁻¹

Formulation Code	BR1	BR2	BR3	BR4
wt/wt% Rambai Extr.	17	20	23	25
0	40845	38603	35445	32241
1	28615	26182	22813	19291
2	25813	23297	19325	15087
3	22463	19439	16213	12007
4	19762	16015	12013	10332
5	17235	14312	10662	7724

Note: The shaded column showed a 2 layer product's physical separation has occurred.

APPENDIX I

YIELD AND HYSTERESIS VALUE FOR MOISTURISER PRODUCT

Table I.1 Yield stress and hysteresis value for moisturiser base products

Formulation Code	B1	B2	B3	B4	B5	B6	B7	B8
Viscosity at 0.1288 s ⁻¹	47361	51183	55170	58276	64701	69913	74898	79997
Yield Stress Value	149.187	149.532	150.170	150.505	151.175	151.785	152.497	153.234
Hysteresis Value, A	699	750.5	813.9	925.2	1078	1171	1277	1356

Table I.2 Yield stress and hysteresis for moisturiser products containing *Baccaurea motleyana hook f.* fruit's extract

Formulation Code	MR1	MR2	MR3	MR4	MR5
Viscosity at 0.1288 s ⁻¹	67961	64306	59380	53510	48504
Yield Stress Value	152.230	151.416	150.728	149.615	148.548
Hysteresis Value, A	1210	1118	1094	885.7	743.8

Table I.3 Yield stress and hysteresis value for buffered moisturiser products containing *Baccaurea motleyana hook f.* fruit's extract

Formulation Code	BR1	BR2	BR3	BR4
Viscosity at 0.1288 s ⁻¹	64412	59127	52987	48372
Yield Stress Value	151.175	150.615	149.354	148.438
Hysteresis Value, A	1124	1085	872.8	730.8

Note: The shaded column showed unstable product formulations.

APPENDIX J

MOISTURISER PRODUCT EFFICACY TEST

RESEARCH INFORMATION

INTRODUCTION

This research is about the topical usage of skincare product, namely moisturiser that contain *Baccaurea motleyana hook f.* extract. *Baccaurea motleyana hook f.* extract contain alpha-hydroxy acid, a type of organic acid. Our skin has three layers, the *epidermis*, the *dermis* and the *hypodermis*. The *epidermis* is the most outer part of the skin where there is a layer called *stratum corneum* made out of dead skin cells. The function of alpha-hydroxy acid (AHA) is to speed up the natural process of peeling and shedding of dead cells on the skin by means of causing irritation to the skin. This increases the production of new skin cells. AHA also acts as a *humectant* where it absorbs moisture from the air. Thus, increasing the level of moisture in the skin.

You are invited to take part in this research. However, your participation is voluntary and you may withdraw from this research at any given time.

OBJECTIVE OF RESEARCH

This research is divided into 2 parts. The first is to evaluate the physical characteristics of the moisturiser product and the second part is to study the efficacy of using the product for the period of 4 weeks.

WHAT DO THE PARTICIPANTS NEED TO DO?

If participants agree to take part in this research study, they are requested to sign an agreement letter for their consent. The participants are also required to reveal their history in using cosmetic and skincare products.

WHAT ARE THE ADVANTAGES OF USING THE PRODUCT?

Since the product contains AHA extract, it is expected to lighten, moisturise and soften the skin.

WHAT ARE THE SIDE EFFECTS OF USING THE PRODUCT?

The exfoliating or lightening effects of the skin could cause the skin to become more sensitive. As a result, the skin might suffer conditions such as inflammation, redness and irritation. Also, without enough protection from ultra-violet rays, skin could become darken.

REMINDER

Participants are asked to immediately stop using the product if suffering from any negative effects from usage of the product. You are advised to contact Pn. Zulaikha Paidi for more information on these side effects.

APPENDIX J, continued

CONSENT AGREEMENT

With this, I agree to take part in this research using a skin moisturising product containing *Baccaurea motleyana hookf.* extract being carried out by Pn. Zulaikha Paidi.

I also understand that this research may have side-effects on my skin. However, I am clear of this risk and am free to withdraw my participation at any time. I will also inform the researcher (Pn. Zulaikha Paidi) of any negative effects that may occur during the duration in which the research is being carried out. I am also informed that I can contact the researcher at any moment via this number (Tel: 03-55446969@ 03-55446998).

I am clear that any information concerning myself will be kept as a confidential document pertaining to the record of the researcher. However, I have agreed to let the data being used and analysed accordingly for the purpose of the research study.

I have read and fully understood the contents of this agreement and am inclined to sign it.

Name of participant :

I/C Number :

Date :

Signature :

Name of witness :

I/C Number :

Date :

Signature :

APPENDIX J, continued

PRODUCT EVALUATION FORM

INSTRUCTION:

Assessors must use all sets of products according to the instruction given. Assessors are required to evaluate the product and answer all the questions in the questionnaires given. All the products must be used for the duration of 4 consecutive weeks.

Participant's personal details :

*please dispose of the unnecessary or put √.

Age :	Gender :
Type of skin : normal/dry/oily/combination	
Occupation : _____	
Are you frequently exposed to sunlight : no/a little/yes	
When are you normally exposed to sunlight during the day:	
<input type="checkbox"/> 9.00 to 11.00 am	<input type="checkbox"/> 11.00 to 2.00 pm <input type="checkbox"/> 2.00 to 5.00 pm
Is your face problematic? <input type="checkbox"/> Yes/No	
<input type="checkbox"/> Pimples	<input type="checkbox"/> Scar <input type="checkbox"/> Pigmentation <input type="checkbox"/> Freckles <input type="checkbox"/> Others
Are you used to using skin care products?	Yes/No
The brand of the product used : _____	
Have you ever taken any skin whitening treatment? Yes/No	
If yes, please state when : _____	

APPENDIX J, continued

PRODUCT EVALUATION FORM – PART 1

INSTRUCTION:

Assessors are required to apply the product on the back of the palm and evaluate the product as stated below. Please refer to the table given for product's evaluation rating scale.

Please circle the answer.

A. Product Physical Characteristics

1. Scent of product	1	2	3	4	5
2. Strength of product scent	1	2	3	4	5
3. Product viscosity	1	2	3	4	5
4. Colour of product	1	2	3	4	5
5. Texture of product	1	2	3	4	5

B. Rubbing Effect of Product Application

6. Easiness of product application	1	2	3	4	5
7. Endurance of scent	1	2	3	4	5
8. Absorption into the skin	1	2	3	4	5
9. Moisturising effect	1	2	3	4	5
10. Tackiness of skin	1	2	3	4	5
11. Oiliness of the skin	1	2	3	4	5

C. Overall Product Evaluation

Overall Product Evaluation	1	2	3	4	5
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APPENDIX J, continued

Table J.1 Moisturiser Product's Attributes Rating Scale

Product Attributes	Product's Rating Scale				
	1	2	3	4	5
Physical characteristics					
1. Scent of product	Very bad	Bad	Acceptable	Good	Very good
2. Strength of product's scent	Very weak	Weak	Moderate	Strong	Very strong
3. Viscosity of product	Very thin	Thin	Acceptable	Viscous	Very viscous
4. Colour of product	Very bad	Bad	Acceptable	Good	Very good
5. Texture of product	Very bad	Bad	Acceptable	Good	Very good
6. Easiness of product's application	Very bad	Bad	Acceptable	Good	Very good
Product's rubbing effect					
7. Endurance of product's scent	Very short	Short	Moderate	Long	Very long
8. Absorption into the skin	Very slow	Slow	Moderate	Quick	Very quick
9. Moisturising effect	Very little	Little	Moderate	Much	Very much
10. Tackiness of the skin	Very much	Much	Moderate	Slightly	Very slightly
11. Oiliness of the skin	Very much	Much	Moderate	Slightly	Very slightly
Effectiveness of Product					
12. Moisturising effect	Not effective	Slight effective	Moderate	Effective	Very effective
13. Decrease pigmentation/freckles	Not effective	Slight effective	Moderate	Effective	Very effective
14. Lighten skin colour	Not effective	Slight effective	Moderate	Effective	Very effective
15. Soften of the skin	Not effective	Slight effective	Moderate	Effective	Very effective
16. Reduce skin pore size	Not effective	Slight effective	Moderate	Effective	Very effective
17. Inactivate acne growth	Not effective	Slight effective	Moderate	Effective	Very effective
18. Exfoliating effect	Not effective	Slight effective	Moderate	Effective	Very effective
19. Decrease skin oiliness	Not effective	Slight effective	Moderate	Effective	Very effective
20. Reduce acne scars	Not effective	Slight effective	Moderate	Effective	Very effective
Overall product evaluation	Very bad	Bad	Acceptable	Good	Very good

APPENDIX J, continued

PRODUCT EVALUATION FORM – PART 2

INSTRUCTION:

Assessors are required to apply the product on the face and evaluate the product as stated below. Please refer to the table given for product's evaluation rating scale.

Please circle the answer.

A. Product Physical Characteristics

1. Scent of product	1	2	3	4	5
2. Strength of product scent	1	2	3	4	5
3. Product viscosity	1	2	3	4	5
4. Colour of product	1	2	3	4	5
5. Texture of product	1	2	3	4	5

B. Rubbing Effect of Product Application

6. Easiness of product application	1	2	3	4	5
7. Endurance of scent	1	2	3	4	5
8. Absorption into the skin	1	2	3	4	5
9. Moisturising effect	1	2	3	4	5
10. Tackiness of skin	1	2	3	4	5
11. Oiliness of the skin	1	2	3	4	5

C. Effectiveness of Product (after 4 weeks of product's use)

12. Moisturising skin	1	2	3	4	5
13. Lessens pigmentation/pimples effect	1	2	3	4	5
14. Lightens skin	1	2	3	4	5
15. Softens skin	1	2	3	4	5
16. Makes pores smaller	1	2	3	4	5
17. Makes pimples inactive	1	2	3	4	5
18. Peels skin	1	2	3	4	5
19. Lessens oil on oily skin	1	2	3	4	5
20. Lessens the effects of pimple scars	1	2	3	4	5

D. Overall Product Evaluation

Overall Product Evaluation	1	2	3	4	5
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APPENDIX J, continued

E. Please comment on the product's physical characteristics, after rubbing effect and product effectiveness compared to the commercial product used by rating the product using the following rating scale.

INSTRUCTION:

Assessors are required to apply the product on the face and evaluate the product as stated below. Please refer to the table given for product's evaluation rating scale.

Please circle the answer.

A. Product Physical Characteristics

1. Scent of product	1	2	3	4	5
2. Strength of product scent	1	2	3	4	5
3. Product viscosity	1	2	3	4	5
4. Colour of product	1	2	3	4	5
5. Texture of product	1	2	3	4	5

B. After Rubbing Effect of Product Application

6. Easiness of product application	1	2	3	4	5
7. Endurance of scent	1	2	3	4	5
8. Absorption into the skin	1	2	3	4	5
9. Moisturising effect	1	2	3	4	5
10. Tackiness of skin	1	2	3	4	5
11. Oiliness of the skin	1	2	3	4	5

C. Effectiveness of Product (after 4 weeks of product's use)

12. Moisturising skin	1	2	3	4	5
13. Lessens pigmentation/pimples effect	1	2	3	4	5
14. Lightens skin	1	2	3	4	5
15. Softens skin	1	2	3	4	5
16. Makes pores smaller	1	2	3	4	5
17. Makes pimples inactive	1	2	3	4	5
18. Peels skin	1	2	3	4	5
19. Lessens oil on oily skin	1	2	3	4	5
20. Lessens the effects of pimple scars	1	2	3	4	5

D. Overall Product Evaluation

Overall Product Evaluation	1	2	3	4	5
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APPENDIX J, continued

PRODUCT EVALUATION FORM – PART 3

INSTRUCTION:

Assessors are requested to evaluate the irritation effect of the product and answer the following questions.

Note:

Brief stinging, warming, itchiness, tightness sensation may be a signal of a product's efficacy. But discontinue using the product if the effect is severe.

Please circle the answer.

QUESTIONS

1. Did you experience any unpleasant skin sensations from the product?
 - a. Yes (Continue with the rest of the questions)
 - b. No (Stop. No need to answer the rest of the questions)
2. Did you experience any unpleasant experience after using the product about
 - a. 1 week b. 2 weeks c. 3 weeks d. 4 weeks e. 5 weeks
3. What did you experience?
 - a. tingling b. stinging c. burning sensation d. tightness
 - e. itchiness f. others
4. Where did you experience it?
 - a. Forehead b. Cheek c. Chin d. Mouth area e. Eye area
 - d. Others
5. Would you say the sensations were
 - a. Strong b. Moderate c. Mild e. Slight
5. When did it start?
 - a. Immediately after application b. Within 5 – 10 mins
 - c. Within 15 – 30 mins. d. After 30 mins e. Other
6. How long did it last?
 - a. Within 5 – 10 mins b. Within 15 – 30 mins c. After 30 mins
 - d. Other
7. Would you say this effect influence your opinion of the product?
 - a. Very much b. Somewhat c. Slightly d. Not at all
8. Was the influence positive or negative?
 - a. Positive (Acceptable) b. Negative (Unacceptable)

APPENDIX K

SELF-PRODUCT EVALUATION RESULT

(a) PART 1

Grading Points	1	2	3	4	5
1. Scent of product (%)			56	44	
2. Strength of product scent (%)			72	28	
3. Product viscosity (%)			24	52	24
4. Colour of product (%)			68	32	
5. Texture of product (%)			72	28	
6. Easiness of product application (%)				72	28
7. Endurance of scent (%)		24	68	8	
8. Absorption into the skin (%)				72	28
9. Moisturising effect (%)				64	36
10. Tackiness of skin (%)			8	80	12
11. Oiliness of the skin (%)			8	80	12
12. Overall product evaluation (%)			56	44	

(b) PART 2

Grading Points	1	2	3	4	5
1. Scent of product (%)			56	44	
2. Strength of product scent (%)			72	28	
3. Product viscosity (%)			24	52	24
4. Colour of product (%)			68	32	
5. Texture of product (%)			72	28	
6. Easiness of product application (%)				72	28
7. Endurance of scent (%)		24	68	8	
8. Absorption into the skin (%)				76	24
9. Moisturising effect (%)				60	40
10. Tackiness of skin (%)			8	80	12
11. Oiliness of the skin (%)			8	80	12
12. Moisturising skin (%)				60	40
13. Lessens pigmentation/pimples effect (%)			76	24	
14. Lightens skin (%)			76	24	
15. Softens skin (%)			16	76	8
16. Reducing pore sizes (%)		32	68		
17. Inactivate acne growth			28	72	
18. Exfoliating skin (%)			76	24	
20. Reducing acne scar (%)			76	24	
21. Overall product evaluation (%)			56	44	

APPENDIX L

PRODUCT EVALUATION RESULT – COMPARISON STUDY TO COMMERCIAL PRODUCT

Grading Points	1	2	3	4	5
1. Scent of product (%)			56	44	
2. Strength of product scent (%)			72	28	
3. Product viscosity (%)			24	52	24
4. Colour of product (%)			68	32	
5. Texture of product (%)			72	28	
6. Easiness of product application (%)				72	28
7. Endurance of scent (%)		24	68	8	
8. Absorption into the skin (%)				76	24
9. Moisturising effect (%)				60	40
10. Tackiness of skin (%)			8	80	12
11. Oiliness of the skin (%)			8	80	12
12. Moisturising skin (%)				60	40
13. Lessens pigmentation/pimples effect (%)			76	24	
14. Lightens skin (%)			76	24	
15. Softens skin (%)			16	76	8
16. Reducing pore sizes (%)		32	68		
17. Inactivate acne growth			28	72	
18. Exfoliating skin (%)			76	24	~
20. Reducing acne scar (%)			76	24	
21. Overall product evaluation (%)			56	44	

APPENDIX M

PRODUCT EVALUATION RESULT – PART 3

Table M.1: Product evaluation – adverse effect

Type of Questions	Results					Σ Assessors
1. Did you experience any unpleasant skin sensations from the product?	YES	NO				
Number of Assessors	5	20				25
2. Did you experience any unpleasant experience after using the product about	1 wk	2 wk	3 wk	4 wk	immediately	
Number of Assessors	1	1	2		1	5
3. What did you experience?	tingling	stinging	warning	tightness	itchiness	
Number of Assessors		1	2	1	1	5
4. Where did you experience it?	forehead	cheek	chin	mouth	eye area	
Number of Assessors	1	5				5
5. Would you say the sensations were	strong	moderate	mild	slight		
Number of Assessors	1	1	1	2		5
5. When did it start?	Immediately	5-10 mins	15-30 mins	> 30 mins	Other	
Number of Assessors	2	2	1			5
6. How long did it last?	5-10 mins	15-30 mins	> 30 mins	Other, <5mins		
Number of Assessors	2	2		1		5
7. Would you say this effect influence your opinion of the product?	Very much	somewhat	slightly	not at all		
Number of Assessors			4	1		
8. Was the influence positive or negative?	Acceptable	Unacceptable				
Number of Assessors	5					5

APPENDIX N

CHANGES AFTER APPLICATION OF PRODUCT/PLACEBO RESULT

(a) CHEEK – AGE GROUP: 21 – 30 YEARS

Table N.1: Changes After Product/Placebo Application On The Cheek (21-30 Years)

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
1	C	1.7	0.7	2.1	0.6	-53	-16	45	11	0.5	0.3	33	13
2	C	1.8	0.6	2.3	0.6	-52	-17	48	12	0.2	0.2	36	15
3	C	1.6	0.5	2.1	0.7	-55	-16	44	15	0.4	0.2	31	13
4	C	1.9	0.6	2.1	0.7	-56	-20	40	14	0.1	0.5	38	14
5	C	1.8	0.6	2.3	0.7	-52	-19	43	14	0	0.2	36	13
6	C	1.6	0.5	2.3	0.6	-51	-16	45	12	0.4	0.3	34	15
7	C	1.7	0.7	2.3	0.7	-53	-18	45	14	0.3	0.3	33	14
8	C	1.6	0.5	2.1	0.6	-56	-17	43	13	0.1	0.4	35	15
9	C	1.7	0.6	2.2	0.7	-57	-19	45	15	0.3	0.1	35	13
10	C	1.8	0.6	2.3	0.7	-53	-20	42	15	0.2	0.3	32	14
11	C	1.7	0.6	2.2	0.7	-57	-19	45	13	0.3	0.2	35	14
12	C	1.8	0.7	2.3	0.7	-53	-18	42	14	0.2	0.2	32	14
13	C	1.7	0.5	2.1	0.6	-53	-17	45	11	0.5	0.3	33	13
14	C	1.8	0.6	2.3	0.7	-52	-19	48	14	0.2	0.3	36	13
15	C	1.6	0.5	2.1	0.7	-55	-16	44	13	0.4	0.3	31	15

Table N.1: Changes After Product/Placebo Application On The Cheek (21-30 Years) continued

No.	Body		L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Site	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	
16	C	1.9	0.5	2.1	0.6	-56	-17	40	11	0.1	0.4	38	13	
17	C	1.8	0.5	2.3	0.6	-52	-16	43	11	0	0.2	36	13	
18	C	1.6	0.5	2.2	0.6	-57	-17	45	12	0.4	0.2	34	15	
19	C	1.8	0.5	2.3	0.7	-56	-16	48	15	0.3	0.3	37	13	
20	C	1.7	0.6	2.3	0.7	-53	-20	45	14	0.4	0.2	31	14	
21	C	1.7	0.5	2.3	0.6	-53	-17	45	11	0.2	0.2	30	13	
22	C	1.7	0.7	2.4	0.6	-52	-18	46	11	0.2	0.2	32	14	
23	C	1.5	0.6	1.8	0.7	-48	-20	38	15	0	0.3	35	14	
24	C	1.6	0.6	2.3	0.7	-51	-19	45	14	0.4	0.2	34	15	

(b) CHEEK – AGE GROUP: 31 – 40 YEARS

Table N.2: Changes After Product/Placebo Application On The Cheek (31-40 Years)

No.	Body		L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Site	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	
1	C	1.3	0.1	1.6	0.4	-43	-10	36	7	-0.1	0.2	20	10	
2	C	1.2	0.1	1.5	0.5	-40	-11	33	9	-0.3	0.2	23	11	
3	C	1.4	0.3	1.8	0.4	-48	-15	38	8	0	0.2	27	9	
4	C	1.1	0.2	1.6	0.4	-44	-12	34	8	0.2	0.1	25	12	
5	C	1.4	0.2	1.7	0.4	-46	-12	37	7	0.1	0.2	28	10	

Table N.2: Changes After Product/Placebo Application On The Cheek (31-40 Years) continued

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	
6	C	1.2	0.1	1.5	0.5	-45	-10	33	9	0.3	0.2	24	9
7	C	1.3	0.4	1.5	0.5	-43	-15	34	9	0.2	0.2	27	9
8	C	1.3	0.2	1.7	0.4	-44	-12	36	7	-0.1	0.1	25	12
9	C	1.2	0.2	1.6	0.4	-45	-12	34	6	0.3	0.2	28	10
10	C	1.3	0.4	1.8	0.5	-46	-15	39	8	0.1	0.1	23	9
11	C	1.4	0.3	1.7	0.5	-46	-13	37	9	0.1	0.1	28	12
12	C	1.2	0.1	1.8	0.4	-45	-10	39	7	0.6	0.1	27	11
13	C	1.3	0.2	1.7	0.4	-42	-12	36	7	0.3	0.1	24	10
14	C	1.2	0.30	1.8	0.40	-46	-14	39	7	0.4	0.1	21	11
15	C	1.5	0.1	1.8	0.4	-48	-10	38	6	0	0.1	26	10
16	C	1.4	0.1	1.6	0.5	-40	-11	36	8	-0.3	0.2	23	11
17	C	1.2	0.2	1.5	0.4	-43	-12	32	7	-0.4	0.2	21	10
18	C	1.3	0.1	1.6	0.5	-41	-11	37	9	-0.3	0.2	25	11
19	C	1.4	0.3	1.6	0.4	-43	-14	36	6	0.4	0.2	20	9
20	C	1.3	0.1	1.8	0.4	-42	-10	39	7	0.1	0.1	23	10
21	C	1.1	0.3	1.6	0.5	-44	-15	35	8	0.4	0.1	24	12
22	C	1.2	0.2	1.8	0.4	-41	-12	38	6	0.2	0.1	27	11
23	C	1.3	0.1	1.7	0.4	-44	-10	35	7	0.2	0.2	28	10
24	C	1.5	0.30	1.5	0.40	-40	-14	39	7	0.3	0.1	23	11

(c) CHEEK – AGE GROUP: 41 – 50 YEARS

Table N.3: Changes After Product/Placebo Application On The Cheek (41-50 Years)

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	
1	C	0.8	0	1.3	0.2	-35	-2	26	2	0.1	0.2	13	5
2	C	1	0.2	1.3	0.3	-38	-5	29	4	0	0.2	16	8
3	C	0.9	0.1	1.2	0.3	-39	-1	29	4	0.1	0.2	15	8
4	C	0.7	0.1	1.4	0.3	-35	-1	25	2	0.1	0.2	12	6
5	C	1	0.1	1.2	0.2	-35	-1	26	3	0	0.3	19	7
6	C	1	0.2	1.3	0.2	-36	-4	29	2	0	0.2	18	7
7	C	0.9	0	1.2	0.3	-35	-1	29	4	0.1	0.2	13	6
8	C	1	0	1.2	0.3	-37	-2	26	2	0.1	0.2	16	8
9	C	0.8	0.1	1.3	0.3	-30	-2	20	2	0.1	-0.1	16	5
10	C	0.9	0.1	1.1	0.3	-35	-2	28	3	0	0.1	14	5
11	C	1	0.1	1.4	0.3	-32	-3	25	4	0.1	0.1	13	5
12	C	0.7	0.1	1.3	0.3	-31	-2	27	4	0.1	0.1	17	7
13	C	0.9	0	1.3	0.3	-35	-1	23	4	0	0.3	13	6
14	C	0.7	0	1.1	0.3	-33	-1	25	2	0	0.2	16	7
15	C	0.9	0.1	1.4	0.2	-37	-2	28	2	0.1	0.3	18	6
16	C	0.6	0	1.3	0.3	-34	-1	23	4	0.1	0.1	22	7
17	C	0.6	0.1	1.2	0.3	-31	-3	26	2	0.1	0.1	12	5
18	C	0.6	0.1	1.1	0.3	-30	-2	29	2	0.1	0.1	10	8
19	C	0.6	0.1	1.1	0.2	-31	-2	22	2	0.1	0	11	8

Table N.3: Changes After Product/Placebo Application On The Cheek (41-50 Years), continued

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
20	C	0.8	0.1	1.3	0.3	-30	-1	21	4	0	0.2	15	8
21	C	0.9	0	1.1	0.2	-33	-1	25	3	0	0	19	6
22	C	0.7	0	1.4	0.2	-31	-2	28	2	0.1	0.2	11	7
23	C	0.6	0.1	1.1	0.3	-30	-2	29	2	0.1	0.1	15	5
24	C	0.6	0.1	1.1	0.3	-31	-1	22	4	0	0.1	11	5

(d) T-ZONE – AGE GROUP: 21 – 30 YEARS

Table N.4: Changes After Product/Placebo Application at T-Zone (21-30 Years)

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
1	FR	1.3	0.4	1.8	0.5	-44	-13	30	6	0.5	-0.2	45	15
2	FR	1.4	0.4	1.7	0.5	-47	-11	33	6	0.6	-0.2	40	18
3	FR	1.2	0.5	1.6	0.6	-43	-14	32	8	0.3	-0.2	43	16
4	FR	1.1	0.5	1.8	0.6	-45	-13	35	7	0.1	-0.3	41	18
5	FR	1.3	0.4	1.7	0.5	-44	-12	36	6	0.2	0.4	43	15
6	FR	1.2	0.4	1.7	0.5	-45	-11	35	8	0.1	0.9	43	19
7	FR	1.3	0.5	1.8	0.6	-42	-14	30	10	0.2	0.8	45	17
8	FR	1.3	0.4	1.7	0.6	-45	-12	36	9	0.2	0.8	41	16
9	FR	1.2	0.5	1.8	0.5	-45	-14	32	6	0.3	0.5	46	15

Table N.4: Changes After Product/Placebo Application at T-Zone (21-30 Years), continued

No.	Body	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Site	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
10	FR	1.1	0.4	1.7	0.5	-42	-13	35	6	0.1	0.2	45	15
11	FR	1.3	0.4	1.7	0.5	-44	-11	38	6	0.1	0.3	46	18
12	FR	1.4	0.5	1.8	0.6	-46	-14	36	8	0.2	0.4	42	16
13	CH	1.2	0.4	1.7	0.5	-48	-12	34	7	0.2	0.5	43	17
14	CH	1.3	0.5	1.7	0.6	-42	-15	33	9	0.1	0.2	46	16
15	CH	1.2	0.4	1.7	0.5	-43	-11	33	6	0.1	0.2	42	15
16	CH	1.3	0.5	1.8	0.6	-45	-13	33	8	0.1	0.3	46	15
17	CH	1.2	0.5	1.8	0.5	-45	-12	32	6	0.3	0.2	46	18
18	CH	1.1	0.4	1.7	0.5	-42	-13	35	7	0.1	0.3	45	16
19	CH	1.3	0.5	1.7	0.6	-44	-14	38	8	0.1	0.2	46	17
20	CH	1.1	0.4	1.7	0.5	-43	-11	34	6	0	0.2	40	16
21	CH	1.3	0.5	1.9	0.5	-46	-13	37	7	0.1	0.1	43	19
22	CH	1.2	0.5	1.7	0.5	-43	-11	35	7	0.4	0.1	45	17
23	CH	1.1	0.4	1.7	0.6	-43	-12	34	9	0	0.1	40	16
24	CH	1.3	0.5	1.9	0.5	-46	-12	37	6	0.1	0.1	43	19

(e) T-ZONE – AGE GROUP: 31 – 40 YEARS

Table N.5: Changes After Product/Placebo Application at T-Zone (31-40 Years)

No.	Body	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
	Site	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
1	FR	0.8	0.2	1.3	0.4	-33	-6	22	5	0.2	0.2	30	13
2	FR	0.7	0.2	1.2	0.3	-32	-6	21	2	0.1	0.2	32	12
3	FR	0.9	0.1	1.4	0.3	-35	-5	25	3	0.1	0.2	36	13
4	FR	0.8	0.2	1.3	0.4	-31	-7	23	4	0.2	0.1	33	12
5	FR	0.8	0.2	1.2	0.3	-33	-8	21	3	0.1	0.2	31	11
6	FR	0.9	0.2	1.1	0.4	-36	-7	20	4	0.2	0.1	38	13
7	FR	0.8	0.1	1.1	0.3	-33	-6	25	3	0.2	0.1	30	11
8	FR	0.7	0.3	1.2	0.3	-30	-9	27	3	0.4	0.2	35	14
9	FR	1	0.2	1.3	0.4	-35	-7	29	4	0.1	0.2	33	12
10	FR	0.7	0.1	1.2	0.3	-34	-6	29	3	0.1	0.2	38	13
11	FR	0.8	0.3	1.3	0.3	-35	-10	28	3	0.3	0.2	30	12
12	FR	0.8	0.2	1.3	0.3	-35	-8	25	3	0.2	0.2	30	11
13	CH	0.7	0.3	1.3	0.3	-34	-10	27	3	0.2	0.2	33	12
14	CH	0.8	0.1	1.4	0.3	-34	-5	27	2	0.1	0.1	30	13
15	CH	0.8	0.1	1.2	0.3	-33	-6	23	3	0.2	0.2	32	13
16	CH	0.7	0.2	1.2	0.4	-36	-8	24	4	0.2	0.2	35	12
17	CH	0.7	0.2	1.3	0.3	-37	-7	26	3	0.4	0.2	37	12
18	CH	0.8	0.1	1.2	0.4	-33	-5	25	5	0.5	0.1	27	14
19	CH	0.8	0.1	1.2	0.3	-37	-6	23	3	0.2	0.2	30	14

Table N.5: Changes After Product/Placebo Application at T-Zone (31-40 Years), continued

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
20	CH	0.8	0.2	1.2	0.3	-37	-7	23	2	0.2	0.1	30	12
21	CH	0.9	0.3	1.3	0.3	-38	-9	25	3	0	0.2	30	14
22	CH	0.8	0.1	1.3	0.3	-34	-5	26	3	0	0.1	35	11
23	CH	0.7	0.2	1.4	0.3	-35	-7	27	2	0.3	0.2	34	12
24	CH	0.9	0.1	1.2	0.3	-37	-9	23	3	0.1	0.1	37	13

(f) T-ZONE – AGE GROUP: 41 – 50 YEARS

Table N.6: Changes After Product/Placebo Application at T-Zone (41-50 Years)

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
1	FR	0.4	0.1	0.6	0.1	-25	-1	15	4	0	0.1	27	5
2	FR	0.3	0.1	0.5	0.3	-26	-1	16	4	0	0.1	25	9
3	FR	0.5	0.1	0.8	0.3	-25	-2	18	3	0.1	0	22	10
4	FR	0.5	0	0.7	0.2	-26	-1	17	2	0.1	0.1	26	8
5	FR	0.4	0	0.6	0.2	-27	-3	16	3	0.1	0.1	24	8
6	FR	0.5	0.1	0.5	0.3	-26	-2	17	4	0.1	0.1	21	9
7	FR	0.5	0.1	0.9	0.2	-24	-2	15	3	0.2	0	23	10
8	FR	0.5	0	0.7	0.2	-26	-1	16	2	0.1	0	26	10
9	FR	0.4	0	0.8	0.2	-28	-1	19	2	0.1	0.1	23	8

Table N.6: Changes After Product/Placebo Application at T-Zone (41 -50 Years), continued

No.	Body Site	L-Value		a-Value		Melanin		Erythema		pH		Skin Hydration	
		Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo	Product	Placebo
10	FR	0.4	0.1	0.5	0.3	-23	-2	16	4	0.1	0.1	26	8
11	FR	0.3	0.1	0.7	0.2	-26	-2	18	2	0.3	0.1	20	9
12	FR	0.5	0.1	0.8	0.2	-23	-1	18	2	0.1	0	27	9
13	CH	0.4	0.1	0.9	0.2	-25	-2	16	2	0.1	0.1	25	8
14	CH	0.5	0.1	0.7	0.2	-26	-1	19	2	0.1	0.1	24	9
15	CH	0.3	0	0.7	0.2	-20	-2	16	2	0.1	0	23	8
16	CH	0.2	0	0.8	0.3	-24	-2	18	4	0.3	0.1	26	9
17	CH	0.4	0	0.8	0.2	-21	-1	18	2	0	0	20	10
18	CH	0.5	0.1	0.6	0.2	-20	-1	18	3	0.2	0	25	`
19	CH	0.4	0.1	0.8	0.2	-25	-2	16	2	0.1	0.1	23	8
20	CH	0.5	0	0.6	0.3	-22	-2	19	4	0.2	0.1	27	8
21	CH	0.4	0	0.7	0.2	-21	-1	15	2	0	0.1	22	9
22	CH	0.5	0.1	0.8	0.2	-23	-2	15	2	0	0.1	26	8
23	CH	0.3	0.1	0.6	0.2	-27	-1	17	3	0.1	0	20	8
24	CH	0.4	0	0.6	0.3	-30	-2	19	4	0.1	0.1	25	9

APPENDIX O

PAIRED-T TEST ANALYSIS

Table O.1: L - Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t _{table} Value	Hypothesis Null, Ho	Conclusion
		Mean	SD	t _{cal} Value			
CHEEK							
21 - 30	Product	1.713	.1035	47.523	2.069	reject	significant
	Placebo	0.575	.0737				
31 - 40	Product	1.292	.1100	37.419	2.069	reject	significant
	Placebo	.204	.0999				
41 - 50	Product	.8	.0608	22.661	2.069	reject	significant
	Placebo	.075	.1096				
T - ZONE							
21 - 30	Product	1.238	.0924	40.74	2.069	reject	significant
	Placebo	.45	.0511				
31 - 40	Product	.796	.0806	25.883	2.069	reject	significant
	Placebo	.179	.0721				
41 - 50	Product	.417	.0868	18.904	2.069	reject	significant
	Placebo	.058	.0504				

Table O.2 a - Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t _{table} Value	Hypothesis Null, H _o	Conclusion
		Mean	SD	t _{cal} Value			
CHEEK							
21 - 30	Product	2.212	.1296	53.862	2.069	reject	significant
	Placebo	.658	.0504				
31 - 40	Product	1.658	.1139	43.145	2.069	reject	significant
	Placebo	.433	.0482				
41 - 50	Product	1.238	.1096	38.208	2.069	reject	significant
	Placebo	.271	.0464				
T - ZONE							
21 - 30	Product	1.742	.0717	64.976	2.069	reject	significant
	Placebo	.538	.0495				
31 - 40	Product	1.254	.0833	45.561	2.069	reject	significant
	Placebo	.325	.0442				
41 - 50	Product	.696	.1197	15.810	2.069	reject	significant
	Placebo	.225	.0532				

APPENDIX O, *continued*

PAIRED-T TEST ANALYSIS

Table O.3 Melanin Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t_{table} Value	Hypothesis Null, Ho	Conclusion
		Mean	SD	t_{cal} Value			
CHEEK							
21 - 30	Product	-53.58	2.302	-139.927	2.069	reject	significant
	Placebo	17.79	1.474				
31 - 40	Product	-43.71	2.349	-85.341	2.069	reject	significant
	Placebo	12.17	1.810				
41 - 50	Product	-33.5	2.782	-54.832	2.069	reject	significant
	Placebo	-1.88	1.035				
T - ZONE							
21 - 30	Product	-44.25	1.648	-153.097	2.069	reject	significant
	Placebo	12.54	1.215				
31 - 40	Product	-34.46	2.021	-77.923	2.069	reject	significant
	Placebo	6.92	1.501				
41 - 50	Product	-24.54	2.536	-44.195	2.069	reject	significant
	Placebo	-1.58	.584				

Table O.4 Erythema Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t_{table} Value	Hypothesis Null, Ho	Conclusion
		Mean	SD	t_{cal} Value			
CHEEK							
21 - 30	Product	44.13	2.473	49.287	2.069	reject	significant
	Placebo	13.08	1.503				
31 - 40	Product	36.25	2.152	53.485	2.069	reject	significant
	Placebo	7.46	1.021				
41 - 50	Product	25.83	2.808	36.620	2.069	reject	significant
	Placebo	2.88	.947				
T - ZONE							
21 - 30	Product	34.29	2.216	49.974	2.069	reject	significant
	Placebo	7.17	1.239				
31 - 40	Product	24.75	2.507	38.461	2.069	reject	significant
	Placebo	3.17	.816				
41 - 50	Product	16.96	1.398	43.21	2.069	reject	significant
	Placebo	2.79	.884				

APPENDIX O, *continued*

PAIRED-T TEST ANALYSIS

Table O.5: pH Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t_{table} Value	Hypothesis Null, Ho	Conclusion
		Mean	SD	t_{cal} Value			
CHEEK							
21 - 30	Product	.254	.1532	-0.214	2.069	accept	insignificant
	Placebo	.263	.0875				
31 - 40	Product	.238	.1469	2.782	2.069	reject	significant
	Placebo	.150	.0511				
41 - 50	Product	.063	.0495	-4.507	2.069	reject	significant
	Placebo	.158	.083				
T - ZONE							
21 - 30	Product	.188	.1484	-2.366	2.069	reject	significant
	Placebo	.321	.2284				
31 - 40	Product	.192	.1213	0.947	2.069	accept	insignificant
	Placebo	.167	.0482				
41 - 50	Product	.108	.083	2.095	2.069	reject	significant
		.067	.0482				

Table O.6: Skin Hydration Value - Comparison of product and placebo t value at 0.05 significant level

Age	Type of Product	SPSS 11.5 Calculation			t_{table} Value	Hypothesis Null, Ho	Conclusion
		Mean	SD	t_{cal} Value			
CHEEK							
21 - 30	Product	34.04	2.274	39.571	2.069	reject	significant
	Placebo	13.83	.816				
31 - 40	Product	24.58	2.586	25.886	2.069	reject	significant
	Placebo	10.42	1.018				
41 - 50	Product	14.79	3.050	13.16	2.069	reject	significant
	Placebo	6.46	1.179				
T - ZONE							
21 - 30	Product	43.54	2.126	49.212	2.069	reject	significant
	Placebo	16.67	1.341				
31 - 40	Product	32.75	3.068	30.713	2.069	reject	significant
	Placebo	12.46	.977				
41 - 50	Product	24	2.284	26.513	2.069	reject	significant
		8.63	1.096				

APPENDIX P

ONE-WAY ANALYSIS OF VARIANCE (ANOVA, SINGLE FACTOR)

Table P.1: Body Site: Cheek , Analysed at 0.05 Significant Level
(Anova, Single Factor)

Variables		Sum of Squares	df	Mean Square	F Value	Significant at 0.05	Conclusion
L - Value	Between Groups	10.012	2	5.006	324.458	.000	Significant
	Within Groups	1.065	69	.015			
	Total	11.077	71				
a - Value	Between Groups	11.479	2	5.739	412.155	.000	Significant
	Within Groups	.961	69	.014			
	Total	12.439	71				
	Within Groups	1.149	69	.017			
	Total	13.471	71				
Melanin	Between Groups	4840.528	2	2420.264	391.287	.000	Significant
	Within Groups	426.792	69	6.185			
	Total	5267.319	71				
Erythema	Between Groups	4040.861	2	2020.431	325.375	.000	Significant
	Within Groups	428.458	69	6.210			
	Total	4469.319	71				
pH	Between Groups	.541	2	.271	17.094	.000	Significant
	Within Groups	1.092	69	.016			
	Total	1.633	71				
Skin Hydration	Between Groups	4447.194	2	2223.597	315.209	.000	Significant
	Within Groups	486.750	69	7.054			
	Total	4933.944	71				
	Within Groups	180.917	69	2.622			
	Total	1567.778	71				

Note: ANOVA is to compare all means value for product with different groups of age. If alpha value (Significant column) < 0.05, the result is considered significant. This means H_0 can be rejected and there is a significant difference among the ages group means result.

APPENDIX P, *continued*

ONE-WAY ANALYSIS OF VARIANCE (ANOVA, SINGLE FACTOR)

Table P.2: Body Site: T-Zone, Analysed at 0.05 Significant Level
(Anova, Single Factor)

Variables		Sum of Squares	df	Mean Square	F	Significant at 0.05	Conclusion
L - Value	Between Groups	8.101	2	4.050	538.32 2	.000	Significant
	Within Groups	.519	69	.008			
	Total	8.620	71				
a - Value	Between Groups	13.145	2	6.573	746.52 2	.000	Significant
	Within Groups	.607	69	.009			
	Total	13.753	71				
	Within Groups	1.508	69	.022			
	Total	11.815	71				
Melanin	Between Groups	4661.083	2	2330.542	528.24 8	.000	Significant
	Within Groups	304.417	69	4.412			
	Total	4965.500	71				
Erythema	Between Groups	3617.583	2	1808.792	412.69 8	.000	Significant
	Within Groups	302.417	69	4.383			
	Total	3920.000	71				
pH	Between Groups	.106	2	.053	3.641	.031	Significant
	Within Groups	1.003	69	.015			
	Total	1.109	71				
Skin Hydration	Between Groups	4599.194	2	2299.597	360.24 3	.000	Significant
	Within Groups	440.458	69	6.383			
	Total	5039.653	71				
	Within Groups	323.458	69	4.688			
	Total	1754.319	71				

Note: ANOVA is to compare all means value for product with different groups of age. If alpha value (Significant column) < 0.05, the result is considered significant. This means H_0 can be rejected and there is a significant difference among the ages group means result.

APPENDIX Q

POST HOC ANALYSIS - DUNCAN METHOD

Overall Changes at 5% Significant Level
Uses Harmonic Mean Sample Size = 24

Table Q.1: Post Hoc Analysis – Duncan Method (L* Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	.800			The means of the three age groups are significantly different from each other.
31-40	24		1.292		
21-30	24			1.713	
Significant at alpha = .05		1.000	1.000	1.000	
T-Zone					
41-50	24	.417			The means of the three age groups are significantly different from each other.
31-40	24		.796		
21-30	24			1.238	
Significant at alpha = .05		1.000	1.000	1.000	

Table Q.2 Post Hoc Analysis – Duncan Method (a* Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	1.238			The means of the three age groups are significantly different from each other.
31-40	24		1.658		
21-30	24			2.212	
Significant at alpha = .05		1.000	1.000	1.000	
T-Zone					
41-50	24	.696			The means of the three age groups are significantly different from each other.
31-40	24		1.254		
21-30	24			1.742	
Significant at alpha = .05		1.000	1.000	1.000	

Table Q.3 Post Hoc Analysis – Duncan Method (Melanin Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	-33.5			The means of the three age groups are significantly different from each other.
31-40	24		-43.71		
21-30	24			-53.58	
Significant at alpha = .05		1.000	1.000	1.000	
T-Zone					
41-50	24	-24.54			The means of the three age groups are significantly different from each other.
31-40	24		-34.46		
21-30	24			-44.25	
Significant at alpha = .05		1.000	1.000	1.000	

APPENDIX Q, *continued*

POST HOC ANALYSIS - DUNCAN METHOD

Table Q.4 Post Hoc Analysis – Duncan Method (Erythema Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	25.83			The means of the three age groups are significantly different from each other.
31-40	24		36.25		
21-30	24			44.13	
Significant at alpha = .05		1.000	1.000	1.000	
T-Zone					
41-50	24	16.96			The means of the three age groups are significantly different from each other.
31-40	24		24.75		
21-30	24			34.29	
Significant at alpha = .05		1.000	1.000	1.000	

Table Q.5 Post Hoc Analysis – Duncan Method (pH Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	.063			The means of age group 1 is significantly difference from 2 & 3. The means of group 2 & 3 is not significantly different.
31-40	24		.238		
21-30	24		.254		
Significant at alpha = .05		1.000	.648		
T-Zone					
41-50	24	.108			
31-40	24		.188		
21-30	24		.192		
Significant at alpha = .05		1.000	.905		

Table Q.6 Post Hoc Analysis – Duncan Method (Skin Hydration Value)

Cheek		Means value			Conclusion
Age	N	1	2	3	
41-50	24	14.79			The means of the three age groups are significantly different from each other.
31-40	24		24.58		
21-30	24			34.04	
Significant at alpha = .05		1.000	1.000	1.000	
T-Zone					
41-50	24	24.00			The means of the three age groups are significantly different from each other.
31-40	24		32.75		
21-30	24			43.54	
Significant at alpha = .05		1.000	1.000	1.000	

APPENDIX R

DESCRIPTIVE PRODUCT EVALUATION RESULT

Table R.1 Product Evaluation (Part 1) – Application of Product on Back of the Palm

Characteristics	N	Rating Scale				
Physical Characteristics		1	2	3	4	5
1. Product scent (%)	25		4	16	56	24
2. Strength of product scent (%)	25		8	36	40	16
3. Product viscosity (%)	25		4	4	56	36
4. Colour of product (%)	25		4	4	48	44
5. Texture of product (%)	25		4	12	44	40
6. Easiness of product's application (%)	25			4	20	76
Effect of Product Application						
7. Endurance of scent (%)	25		12	64	16	8
8. Absorption into skin (%)	25		4	12	36	48
9. Moisturising effect (%)	25			24	60	16
10. Tackiness of the skin (%)	25		4	24	56	16
11. Oiliness of the skin (%)	25	4	4	28	56	12
12. Overall Evaluation (%)	25			24	64	12

Table R.2 Product Evaluation (Part 2) – Application of Product on the Face

Characteristics	N	Rating Scale				
Physical Characteristics		1	2	3	4	5
1. Product scent (%)	25			20	60	20
2. Strength of product scent (%)	25		8	36	44	12
3. Product viscosity (%)	25			8	52	40
4. Colour of product (%)	25		4	8	44	44
5. Texture of product (%)	25			16	36	48
6. Easiness of product's application (%)	25			8	24	68
Effect of Product Application						
7. Endurance of scent (%)	25		16	52	24	8
8. Absorption into skin (%)	25		8	8	44	40
9. Moisturising effect (%)	25		8	12	36	44
10. Tackiness of the skin (%)	25		4	16	60	20
11. Oiliness of the skin (%)	25		4	16	60	20

APPENDIX R, *continued*

DESCRIPTIVE PRODUCT EVALUATION

Table R.3 Product Evaluation (Part 2) – Effectiveness After 4 Weeks
Application of Product

Characteristics	N	Rating Scale				
		1	2	3	4	5
12. Moisturising skin (%)	25		4	8	60	28
13. Lessens pigmentation or pimples effect (%)	25		12	28	48	12
14. Lightens skin (%)	25		4	36	48	12
15. Softens skin (%)	25			24	24	52
16. Make skin pores smaller (%)	25		8	64	20	8
17. Make pimples inactive (%)	25		8	24	48	20
18. Peels of the skin (%)	25		12	28	48	12
19. Lessens the effects of acne scars (%)	25		12	28	48	12
20. Overall Evaluation (%)	25			20	60	20