R/L: Until Final Report Completed

Clinical Summary\*

x Topline Summary 🞏 Follow-up Analysis/Breakout 🞏 Other\_\_\_\_\_\_\_\_\_\_\_\_\_

**DRAFT to go to Jim Henry and Jim Schwartz**

|  |  |
| --- | --- |
| To: | Jim Henry, Jim Schwartz, Holly Krigbaum, Chris Irwin |
| From: | Lin Fei, Haruko Mizoguchi, Rob Hinkle, Maaike Bose |
| Date: | Aug 30, 2012 |
| Study Name: | Method Development: Oxidative Damage of Scalp and Emerging Hair |
| Study Number: | CRB 11-12-149 |
| Study Dates: | 2/12 thru 6/4/2012 |
| Project: | BC-491 |

**Objective**:

The primary objective of this study was to determine if existing methods of measuring oxidative damage to skin and emerging hair are capable of measuring differences between: 1) dandruff and non-dandruff subject population and 2) BC-1 and cosmetic shampoo in dandruff subjects.

**Materials Tested:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Code | Test Material | Purpose | Dose Frequency | Master Formula # | Batch #/Lot # |
| A | BC-1, Anti-dandruff Shampoo containing 1% ZPT | Benchmark AD shampoo | 3 times a week | *99586340-004* | *MVF 1937-077* |
| B, C | Pantene Classic Care | Benchmark cosmetic shampoo | 3 times a week | *99480496-003* | *MVF 1937-076* |

**Key Findings:**

A comparison of baseline surface skin marker levels from tape strips between the dandruff and non-dandruff groups showed the following lipid measures to be capable of discriminating these two groups: HODE, HODE normalized to linoleic acid, squalene hydroperoxide and linoleic acid. The dandruff group had a higher level of these markers than non-dandruff group. The dandruff group had a significantly higher baseline level of oxidized protein when this parameter was measured by FTZ method and expressed without normalizing to protein. However when the values were normalized to protein, no significant difference was found in oxidized protein between the dandruff and non-dandruff group. The differences in SIM’s (IL-lra:IL-1ratio, IL-1ra, human serum albumin, protein and keratin) were significant between dandruff and non-dandruff groups.

Cysteic acid was measured in hair samples. When the levels of cysteic acid and cysteic acid normalized to weight of hair samples were compared between the dandruff and non-dandruff groups, the differences were not significant.

When the change from baseline in BC-1 was compared to Pantene in dandruff subjects, a significantly greater reduction was detected in HODE, HODE normalized to linoleic acid, squalene hydroperoxide normalized to squalene. BC-1 showed a significantly greater reduction in oxidized protein compared to Pantene when non-protein normalized values were used for a comparison but not after the values were normalized to protein. BC-1 produced a significant reduction in histamine, IL-1ra:IL-1α ratio, IL-1ra, human serum albumin, involucrin and protein, and increase in keratin.

No significant treatment differences between BC-1 and Pantene were observed in the levels of cysteic acid and cysteic acid normalized to weight of hair samples after 16 weeks of treatment period.

In this study, BC-1 showed a significantly greater reduction in ASFS by 10.8 units at Week 16 compared to Pantene. At Week 3, the difference in ASFS reduction from baseline between BC-1 and Pantene was not significant. A higher ASFS entrance criterion (ASFS of 30 or higher) was employed in this study.

*Note*: The grouping letters in the summary tables ‘a’ in appendices are for comparisons of estimated mean values without adjusting for baseline covariate. The actual p-values are found in tables ‘c’ . Tables ‘b’ provide p-values for change from baseline pairwise comparisons for post-treatment time points. Comparisons of change from baselines are more robust way of assessing a treatment difference between BC-1 and Pantene among dandruff subjects, whereas mean values are more appropriate for Dandruff vs. Non-dandruff comparison..

**Summary of Results:**

Below table lists the endpoints (excluding exploratory endpoints) for this study. This report summarizes data on oxidized lipids, oxidized proteins, cytokines and SkinMAP all from tape strip samples, cysteic acid from hair samples and ASFS.

|  |  |  |  |
| --- | --- | --- | --- |
| Endpoints | Specific measures | Sample types  Time points | Assay  Status |
| Oxidized lipids | Lipids and oxidized lipids  (±)-​9-​hydroxy-​10E,​12Z-​octadecadienoic acid and (±)-​13-​hydroxy-​10E,​12Z-​octadecadienoic acid (HODE)  HODE normalized to Linoleic acid (HODE:C18\_2)  Squalene hydroperoxide (SQ\_OOH)  Squalene hydroperoxide normalized to Squalene (SQ-OOH:SQ)  Oxidosqualene (SQ\_Oxide)  Oxidosqualene normalized to Squalene (SQ\_Oxide:SQ)  Squalene  Linoleic acid (C18\_2) | Tape strips  B, Wk3, Wk16 | Completed |
| Oxidized proteins | Oxidized protein tagged by fluorescein-5-thiosemicarbazide is reported in the following two formats:  WellScanFTZ (with and without normalizing to protein)  EndPtFtz (with and without normalizing to protein) | Tape strips  B, Wk3, Wk16 | Completed |
| Cytokines | IL-lra:ILratio  IL-1ra (normalized to protein)  IL-(normalized to protein) | Tape strips  B, Wk3, Wk16 | Completed |
| SkinMAP | Human serum albumin (Hsa, normalized to protein)  Involucrin (normalized to protein)  Keratin 1,10 (normalized to protein) | Tape strips  B, Wk3, Wk16 | Completed |
| Histamine | Histamine (normalized to protein) | Tape strips  B, Wk3, Wk16 | Completed |
| Cysteic acid | Cysteic acid by amino acid analysis  Cysteic acid normalized to hair sample weight in grams (CycteicAcid:HrWeight) | Hair clipping  B, Wk16 | Completed |
| Surface energy | Surface energy | Hair clipping  B, Wk16 | Not completed |
| Hair diameter | Hair diameter by Fraunhofer | Hair clipping  B, Wk16 | Not completed |
| ASFS | ASFS | B, Wk3, Wk16 | N/A |

**Comparison of Dandruff and Non-Dandruff Populations**

Appendix I compares baseline values from dandruff and non-dandruff groups on each of the measures used to quantify oxidized lipid, oxidized proteins, histamine, cytokines, Skin MAP (all from tape strip samples) and cysteic acid (from hair samples) in this study.

Among lipid measures, the dandruff group had a significantly higher level of HODE, HODE normalized to linoleic acid, squalene hydroperoxide and linoleic acid compared to non-dandruff group. No significant difference was found between these groups in squalene hydroperoxide normalized to squalene, oxidosqualene, oxidosqualene normalized to squalene and squalene.

The dandruff group had a significantly higher baseline level of oxidized protein when this parameter was measured by FTZ method and expressed without normalizing to protein. However when the values were normalized to protein, no significant difference was found in oxidized protein between the dandruff and non-dandruff group.

The significant differences between dandruff and non-dandruff groups were found in the following SIMs: higher levels of IL-lra:IL-1ratio, IL-1ra, human serum albumin, protein and lower level of keratin in dandruff group.

No significant difference was observed between dandruff and non-dandruff group in cysteic acid or cysteic acid per gram of hair

**Comparison of BC-1 and Cosmetic Shampoo in Dandruff Subjects**

Oxidized Lipids

Among lipid markers measured, BC-1 produced a significantly greater reduction compared to Pantene in HODE at Weeks 3 and 16 (p<0.01) and in HODE normalized to linoleic acid at Week 3 (p=0.005). A greater reduction in squalene hydroperoxide normalized to squalene was also observed after BC-1 compared to Pantene at Week 3 (p=0.013); at Week 16, Pantene group showed an increase from baseline and BC-1 group showed a decrease from baseline; the difference was significant. See Appendix II.

Oxidized Proteins

BC-1 showed a significantly greater reduction in oxidized protein compared to Pantene when non-protein normalized values were used for a comparison: End Point Ftz at Week 16 (p=0.009) and Well Scan Ftz at Weeks 3 and 16 (p<0.05). No significant treatment difference was observed between BC-1 and Pantene group when the End Point Ftz and Well Scan Ftz values were normalized to protein. . See Appendix IIIV.

Histamine

BC-1 produced a significantly greater reduction in histamine than Pantene at Week 3 (p=0.004) and Week 16 (p=0.01). The reductions from baseline at Week 3 were 65% for BC-1 and 21% for Pantene, and at Week 16 were 65% for BC-1 and 2.5% for Pantene. See Appendix IV

Cytokines

BC-1 produced a significantly greater reduction in IL-1ra:IL-1α ratio compared to Pantene group at Week 3 (p=0.0004) and Week 16 (p<0.0001). The reductions from baseline at Week 3 were 52% for BC-1 and 18% for Pantene, and at Week 16 were 84% for BC-1 and 24% for Pantene. See Appendix V.

A significantly greater reduction in IL-1ra was also observed after BC-1 compared to Pantene at Week 3 (p=0.0004) and Week 16 (p<0.0001). The reductions from baseline at Week 3 were 42% for BC-1 and 18% for Pantene and at Week 16 were 77% for BC-1 and 17% for Pantene.

BC-1 also produced a significantly greater reduction in protein compare to Pantene at Week 3 (p=0.036) and Week 16 (p<0.0001).

SkinMAP

After 3 and 16 weeks of BC-1 usage, the levels human serum albumin, involucrin and protein decreased and that of keratin increased significantly from baseline. The comparisons of BC-1 to Pantene showed a significantly greater reduction in involucrin (p<0.05 at Week 3 & 6), human serum albumin (p=0.0003 at Week 16) and protein (p<0.002 at Week 3 & 16), and increase in keratin (p<0.05 at Week 3 & 16). See Appendix VI.

Cysteic acid

The levels of both cysteic acid and cysteic acid normalized to hair sample weight were significantly lower at Week 16 compared to corresponding baselines for BC-1 and Pantene groups. There was no significant treatment difference between BC-1 and Pantene r (p>0.35). See Appendix VII

ASFS

In dandruff subjects, a reduction from baseline in ASFS of 8.6 and 5.7 were observed after 3-week usage of BC-1 and Pantene, respectively. The difference between the treatments was not significant. At Week 16, ASFS reduction was 18.8 in BC-1 and 8.0 in Pantene; this treatment difference was significant (p<0.0001). Note that in this study, a higher ASFS entrance criterion on 30 or more was used in attempt to recruit subjects more severe dandruff flaking. See Appendix VIII.

Other endpoints

The results on surface energy and hair diameter will be reported when the data become available.

Appendix IX contains a summary of weight and length of hair samples collected in the study.

**Study Design Summary:**

This was a double-blind study consisting of 2 weeks of wash-out and 16 weeks of treatment period. During wash-out period, subjects received Pantene Classic Care® and were instructed to wash their hair/scalp using only this shampoo product at least 3 times a week. Subjects then returned to the study site and underwent screening procedures. A total of 120 dandruff subjects meeting the entrance criteria including ASFS > 30 were randomized into either BC-1 or Pantene Classic Care shampoo. In addition, 30 non-dandruff subjects meeting the entrance criteria including ASFS < 8 were assigned to Pantene Classic Care shampoo. During a treatment period, subjects washed their hair/scalp at home 3 times a week for 16 weeks.

Prior to each of 3 visits (Baseline, Treatment Week 3 & 16), subjects refrained from shampooing for 72 hours. At each visit, the qualified dandruff grader assessed the scalp using Adherent Scalp Flaking Score (ASFS) and study personnel collected tapes strip samples for surface lipids, protein and SIMs measurements. In dandruff subjects, these tape strip samples were collected from the octant with the highest ASFS at baseline and in non-dandruff subjects, they were collected from the octant with ASFS=0 at baseline. At Baseline and Week 16, hair samples were collected from D or H octant. Additionally swab samples were collected, and questionnaires were administered during the study.

P-values shown in this report are from 2-sided tests. A p-value < 0.05 was considered statistically significant. Except for ASFS, log transformed values were used in the statistical analyses of oxidized lipids, oxidized protein, SIMs, and cysteic acid measurements.

|  |  |  |  |
| --- | --- | --- | --- |
| **CRB 11-12-149,Oxidative Damage** | | | |
| **Table 1. Demographic Summary** **All Randomized Subjects** | | | |
| Parameter | [A] BC-1 | [B] Pantene | [C] NonDandruff Pantene |
| Statistic/Category | (N=60) | (N=60) | (N=30) |
| Age |  |  |  |
| Mean (SE) | 48.1 (1.82) | 47.5 (1.76) | 48.3 (2.50) |
| Min | 18.0 | 18.0 | 18.0 |
| Max | 73.0 | 74.0 | 75.0 |
| Gender |  |  |  |
| F | 32 (53%) | 32 (53%) | 17 (57%) |
| M | 28 (47%) | 28 (47%) | 13 (43%) |

Note: Histamine and protein analytical data is located in Notebook MBL15109 (Tom Burt).

**Appendix I**

Table 1. Comparison of Lipids, SIMs, and Cysteic Acid between Dandruff and Non-Dandruff Subjects at Baseline

|  | **Measure** | **Baseline Mean** | | **P-Value** |
| --- | --- | --- | --- | --- |
| **Dandruff** | **Non-Dandruff** |
| Oxidized  Skin Lipids | LogHODE | 1.0685 | 0.1247 | <.0001 |
| LogSQ\_OOH | 1.4947 | 1.2617 | 0.0233 |
| LogSQ\_OOHNrm | -2.5865 | -2.7261 | 0.1253 |
| LogSQ\_Oxide | 1.5334 | 1.5196 | 0.8749 |
| LogSQ\_OxideNrm | -2.5478 | -2.4683 | 0.2929 |
| LogSqualene | 4.0824 | 3.9877 | 0.2159 |
| LogC18\_2 | 2.4466 | 2.1646 | 0.0174 |
| Log(HODE:C18\_2) | -1.3781 | -2.0399 | <.0001 |
| Oxidized Protein | LogWellScanFtz | 3.9481 | 3.5559 | <.0001 |
| LogEndPtFt | 2.7860 | 2.4324 | 0.0006 |
| LogWellScanFtzNrm | 2.4272 | 2.4328 | 0.9193 |
| LogEndPtFtzNrm | 1.2651 | 1.3093 | 0.5941 |
| LogProteinFtz | 1.5209 | 1.1231 | <.0001 |
| Cytokine | LogProteinCytokine | 1.0349 | 0.5162 | <.0001 |
| LogIL1aNrm | 0.5441 | 0.8094 | 0.0006 |
| LogIL1raNrm | 1.6683 | 1.2761 | <.0001 |
| LogIL1ra:IL1a | 1.1242 | 0.4668 | <.0001 |
| Skin Map | LogProteinSkinMap | 1.0368 | 0.4966 | <.0001 |
| LogHsaNrm | 0.8329 | 0.5072 | <.0048 |
| LogInvolucrinNrm | -1.3520 | -1.4890 | 0.1013 |
| LogKeratins110Nrm | 1.0698 | 1.6368 | <.0001 |
| Cysteic Acid | LogCysteicAcid | 4.3077 | 4.3654 | 0.3966 |
| LogCysteicAcidNrm | 3.3827 | 3.4409 | 0.3737 |
| Histamine | LogHistamineNrm | -0.5390 | -0.7892 | 0.2249 |
| LogProteinHistamine | 1.1845 | 0.6991 | <.0001 |
| Program:  ...\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 analysis by group.sas | | | | |

**Appendix II**

***Table 2a. Log HODE***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.082 | 12.067 | 0.080 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 1.055 | 11.359 | 0.080 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.125 | 1.333 | 0.113 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 0.423 | 2.650 | 0.068 | -9.298 | <.01\* | -77.82 | 4.13 |
|  | 56 | [B] Pantene | c | 0.775 | 5.960 | 0.069 | -6.435 | <.01\* | -51.92 | 9.12 |
|  | 26 | [C] NonDandruff Pantene | a | 0.146 | 1.399 | 0.102 | 0.041 | 0.92 | 3.04 | 28.81 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | 0.364 | 2.312 | 0.060 | -10.218 | <.01\* | -81.55 | 3.35 |
|  | 54 | [B] Pantene | b | 0.689 | 4.882 | 0.060 | -8.564 | <.01\* | -63.69 | 6.53 |
|  | 22 | [C] NonDandruff Pantene | a | 0.248 | 1.770 | 0.093 | 0.406 | 0.36 | 29.72 | 36.65 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 2b. Log HODE***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8162 | <.0001\* | [A] BC-1 |
|  | [B] | 0.8162 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0042\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0042\* | ------ | 0.0255\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0255\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0092\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0092\* | ------ | 0.0002\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0002\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 14AUG2012 3:32 PM | | | | | |

***Table 2c. Log HODE***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8162 | <.0001\* | [A] BC-1 |
|  | [B] | 0.8162 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0004\* | 0.0252\* | [A] BC-1 |
|  | [B] | 0.0004\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.0252\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0002\* | 0.2985 | [A] BC-1 |
|  | [B] | 0.0002\* | ------ | 0.0001\* | [B] Pantene |
|  | [C] | 0.2985 | 0.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 3a. Log(HODE:C18\_2)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | -1.363 | 0.043 | 0.096 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | -1.393 | 0.040 | 0.096 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | -2.040 | 0.009 | 0.136 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | -1.687 | 0.021 | 0.094 | -0.023 | <.01\* | -52.58 | 8.48 |
|  | 56 | [B] Pantene | b | -1.359 | 0.044 | 0.096 | -0.001 | 0.91 | -2.05 | 17.83 |
|  | 26 | [C] NonDandruff Pantene | a | -1.998 | 0.010 | 0.141 | 0.001 | 0.83 | 5.68 | 28.37 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | -1.424 | 0.038 | 0.078 | -0.009 | 0.33 | -18.72 | 17.31 |
|  | 54 | [B] Pantene | b | -1.199 | 0.063 | 0.077 | 0.015 | 0.22 | 30.02 | 27.44 |
|  | 22 | [C] NonDandruff Pantene | ab | -1.452 | 0.035 | 0.121 | 0.025 | <.01\* | 254.81 | 117.65 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 3b. Log(HODE:C18\_2)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8272 | <.0001\* | [A] BC-1 |
|  | [B] | 0.8272 | ------ | 0.0002\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0002\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0052\* | 0.0140\* | [A] BC-1 |
|  | [B] | 0.0052\* | ------ | 0.8121 | [B] Pantene |
|  | [C] | 0.0140\* | 0.8121 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.1210 | 0.0003\* | [A] BC-1 |
|  | [B] | 0.1210 | ------ | 0.0117\* | [B] Pantene |
|  | [C] | 0.0003\* | 0.0117\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 3:43 PM | | | | | |

***Table 3c. Log(HODE:C18\_2)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8272 | <.0001\* | [A] BC-1 |
|  | [B] | 0.8272 | ------ | 0.0002\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0002\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0158\* | 0.0691+ | [A] BC-1 |
|  | [B] | 0.0158\* | ------ | 0.0003\* | [B] Pantene |
|  | [C] | 0.0691+ | 0.0003\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0415\* | 0.8491 | [A] BC-1 |
|  | [B] | 0.0415\* | ------ | 0.0803+ | [B] Pantene |
|  | [C] | 0.8491 | 0.0803+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 4a. Log SQ-OOH***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.528 | 33.762 | 0.064 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | ab | 1.461 | 28.909 | 0.064 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 1.262 | 18.270 | 0.091 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 1.261 | 18.250 | 0.071 | -17.417 | <.01\* | -48.83 | 7.18 |
|  | 56 | [B] Pantene | a | 1.261 | 18.239 | 0.072 | -10.075 | <.01\* | -35.58 | 9.19 |
|  | 26 | [C] NonDandruff Pantene | a | 1.168 | 14.729 | 0.106 | -4.465 | 0.21 | -23.26 | 16.15 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | 1.243 | 17.486 | 0.067 | -18.052 | <.01\* | -50.80 | 8.23 |
|  | 54 | [B] Pantene | a | 1.346 | 22.169 | 0.066 | -6.324 | 0.13 | -22.20 | 12.90 |
|  | 22 | [C] NonDandruff Pantene | a | 1.432 | 27.067 | 0.104 | 10.146 | 0.07 | 59.96 | 41.66 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 4b. Log SQ\_OOH***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4602 | 0.0180\* | [A] BC-1 |
|  | [B] | 0.4602 | ------ | 0.0760+ | [B] Pantene |
|  | [C] | 0.0180\* | 0.0760+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.2501 | 0.1100 | [A] BC-1 |
|  | [B] | 0.2501 | ------ | 0.4911 | [B] Pantene |
|  | [C] | 0.1100 | 0.4911 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0538+ | 0.0002\* | [A] BC-1 |
|  | [B] | 0.0538+ | ------ | 0.0210\* | [B] Pantene |
|  | [C] | 0.0002\* | 0.0210\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 9:46 AM | | | | | |

***Table 4c. Log SQ\_OOH***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4602 | 0.0180\* | [A] BC-1 |
|  | [B] | 0.4602 | ------ | 0.0760+ | [B] Pantene |
|  | [C] | 0.0180\* | 0.0760+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.9978 | 0.4667 | [A] BC-1 |
|  | [B] | 0.9978 | ------ | 0.4704 | [B] Pantene |
|  | [C] | 0.4667 | 0.4704 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.2764 | 0.1280 | [A] BC-1 |
|  | [B] | 0.2764 | ------ | 0.4839 | [B] Pantene |
|  | [C] | 0.1280 | 0.4839 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 5a. Log(SQ\_OOH:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | -2.575 | 0.003 | 0.058 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | -2.598 | 0.003 | 0.058 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | -2.726 | 0.002 | 0.081 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | -2.770 | 0.002 | 0.059 | -0.001 | <.01\* | -40.02 | 7.06 |
|  | 56 | [B] Pantene | a | -2.633 | 0.002 | 0.060 | -0.000 | 0.48 | -8.17 | 11.01 |
|  | 26 | [C] NonDandruff Pantene | a | -2.786 | 0.002 | 0.088 | -0.000 | 0.21 | -20.02 | 14.14 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | -2.584 | 0.003 | 0.054 | -0.000 | 0.49 | -9.64 | 13.39 |
|  | 54 | [B] Pantene | b | -2.371 | 0.004 | 0.054 | 0.002 | <.01\* | 65.96 | 24.37 |
|  | 22 | [C] NonDandruff Pantene | b | -2.305 | 0.005 | 0.085 | 0.003 | <.01\* | 164.85 | 61.11 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 5b. Log(SQ\_OOH:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7851 | 0.1321 | [A] BC-1 |
|  | [B] | 0.7851 | ------ | 0.1987 | [B] Pantene |
|  | [C] | 0.1321 | 0.1987 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0126\* | 0.1802 | [A] BC-1 |
|  | [B] | 0.0126\* | ------ | 0.5162 | [B] Pantene |
|  | [C] | 0.1802 | 0.5162 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0042\* | 0.0001\* | [A] BC-1 |
|  | [B] | 0.0042\* | ------ | 0.0898+ | [B] Pantene |
|  | [C] | 0.0001\* | 0.0898+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 3:43 PM | | | | | |

***Table 5c. Log(SQ\_OOH:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7851 | 0.1321 | [A] BC-1 |
|  | [B] | 0.7851 | ------ | 0.1987 | [B] Pantene |
|  | [C] | 0.1321 | 0.1987 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.1031 | 0.8864 | [A] BC-1 |
|  | [B] | 0.1031 | ------ | 0.1537 | [B] Pantene |
|  | [C] | 0.8864 | 0.1537 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0063\* | 0.0065\* | [A] BC-1 |
|  | [B] | 0.0063\* | ------ | 0.5134 | [B] Pantene |
|  | [C] | 0.0065\* | 0.5134 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 6a. Log SQ\_Oxide***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | 1.544 | 34.958 | 0.055 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | 1.523 | 33.356 | 0.055 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 1.520 | 33.082 | 0.079 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 1.418 | 26.165 | 0.063 | -9.707 | <.01\* | -27.05 | 6.84 |
|  | 56 | [B] Pantene | a | 1.352 | 22.503 | 0.064 | -10.012 | <.01\* | -30.82 | 6.60 |
|  | 26 | [C] NonDandruff Pantene | a | 1.407 | 25.537 | 0.094 | -5.717 | 0.15 | -18.34 | 11.49 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | 1.320 | 20.889 | 0.058 | -14.750 | <.01\* | -41.39 | 7.23 |
|  | 54 | [B] Pantene | a | 1.299 | 19.886 | 0.057 | -13.450 | <.01\* | -40.30 | 7.30 |
|  | 22 | [C] NonDandruff Pantene | a | 1.440 | 27.527 | 0.090 | -3.259 | 0.56 | -10.67 | 17.15 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 9:46 AM | | | | | | | | | | |

***Table 6b. Log SQ\_Oxide***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7954 | 0.8034 | [A] BC-1 |
|  | [B] | 0.7954 | ------ | 0.9702 | [B] Pantene |
|  | [C] | 0.8034 | 0.9702 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.6952 | 0.5026 | [A] BC-1 |
|  | [B] | 0.6952 | ------ | 0.3299 | [B] Pantene |
|  | [C] | 0.5026 | 0.3299 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.9194 | 0.0665+ | [A] BC-1 |
|  | [B] | 0.9194 | ------ | 0.0776+ | [B] Pantene |
|  | [C] | 0.0665+ | 0.0776+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 9:46 AM | | | | | |

***Table 6c. Log SQ\_Oxide***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7954 | 0.8034 | [A] BC-1 |
|  | [B] | 0.7954 | ------ | 0.9702 | [B] Pantene |
|  | [C] | 0.8034 | 0.9702 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.4652 | 0.9258 | [A] BC-1 |
|  | [B] | 0.4652 | ------ | 0.6292 | [B] Pantene |
|  | [C] | 0.9258 | 0.6292 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.7939 | 0.2658 | [A] BC-1 |
|  | [B] | 0.7939 | ------ | 0.1890 | [B] Pantene |
|  | [C] | 0.2658 | 0.1890 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 7a. Log(SQ\_Oxide:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | -2.560 | 0.0028 | 0.048 | 0.0000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | -2.535 | 0.0029 | 0.048 | 0.0000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | -2.468 | 0.0034 | 0.068 | 0.0000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | -2.614 | 0.0024 | 0.052 | -0.0004 | <.01\* | -14.30 | 5.05 |
|  | 56 | [B] Pantene | a | -2.542 | 0.0029 | 0.053 | -0.0000 | 0.81 | -1.37 | 5.91 |
|  | 26 | [C] NonDandruff Pantene | a | -2.547 | 0.0028 | 0.078 | -0.0005 | 0.07 | -15.08 | 7.50 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | -2.506 | 0.0031 | 0.050 | 0.0002 | 0.35 | 7.65 | 8.47 |
|  | 54 | [B] Pantene | ab | -2.418 | 0.0038 | 0.050 | 0.0008 | <.01\* | 27.35 | 9.93 |
|  | 22 | [C] NonDandruff Pantene | b | -2.298 | 0.0050 | 0.078 | 0.0016 | <.01\* | 47.91 | 18.12 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 3:43 PM | | | | | | | | | | |

***Table 7b. Log(SQ\_Oxide:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7139 | 0.2685 | [A] BC-1 |
|  | [B] | 0.7139 | ------ | 0.4189 | [B] Pantene |
|  | [C] | 0.2685 | 0.4189 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0954+ | 0.9462 | [A] BC-1 |
|  | [B] | 0.0954+ | ------ | 0.1669 | [B] Pantene |
|  | [C] | 0.9462 | 0.1669 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.1321 | 0.0302\* | [A] BC-1 |
|  | [B] | 0.1321 | ------ | 0.2996 | [B] Pantene |
|  | [C] | 0.0302\* | 0.2996 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 3:43 PM | | | | | |

***Table 7c. Log(SQ\_Oxide:SQ)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7139 | 0.2685 | [A] BC-1 |
|  | [B] | 0.7139 | ------ | 0.4189 | [B] Pantene |
|  | [C] | 0.2685 | 0.4189 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.3338 | 0.4751 | [A] BC-1 |
|  | [B] | 0.3338 | ------ | 0.9589 | [B] Pantene |
|  | [C] | 0.4751 | 0.9589 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.2140 | 0.0267\* | [A] BC-1 |
|  | [B] | 0.2140 | ------ | 0.1973 | [B] Pantene |
|  | [C] | 0.0267\* | 0.1973 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 8a. Log C18\_2***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 2.445 | 278.527 | 0.074 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 2.448 | 280.764 | 0.074 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 2.165 | 146.069 | 0.105 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 2.111 | 128.976 | 0.077 | -146.86 | <.01\* | -53.23 | 6.58 |
|  | 56 | [B] Pantene | a | 2.134 | 136.210 | 0.078 | -141.33 | <.01\* | -50.91 | 7.03 |
|  | 26 | [C] NonDandruff Pantene | a | 2.144 | 139.287 | 0.116 | -3.750 | 0.90 | -2.73 | 20.54 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | 1.788 | 61.411 | 0.079 | -209.47 | <.01\* | -77.35 | 3.75 |
|  | 54 | [B] Pantene | a | 1.888 | 77.211 | 0.078 | -199.40 | <.01\* | -72.07 | 4.58 |
|  | 22 | [C] NonDandruff Pantene | a | 1.700 | 50.083 | 0.123 | -86.930 | <.01\* | -63.44 | 9.42 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 9:46 AM | | | | | | | | | | |

***Table 8b. Log C18\_2***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.9737 | 0.0312\* | [A] BC-1 |
|  | [B] | 0.9737 | ------ | 0.0293\* | [B] Pantene |
|  | [C] | 0.0312\* | 0.0293\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.8097 | 0.0044\* | [A] BC-1 |
|  | [B] | 0.8097 | ------ | 0.0081\* | [B] Pantene |
|  | [C] | 0.0044\* | 0.0081\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.3735 | 0.1211 | [A] BC-1 |
|  | [B] | 0.3735 | ------ | 0.3785 | [B] Pantene |
|  | [C] | 0.1211 | 0.3785 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 27AUG2012 9:46 AM | | | | | |

***Table 8c. Log C18\_2***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.9737 | 0.0312\* | [A] BC-1 |
|  | [B] | 0.9737 | ------ | 0.0293\* | [B] Pantene |
|  | [C] | 0.0312\* | 0.0293\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.8296 | 0.8102 | [A] BC-1 |
|  | [B] | 0.8296 | ------ | 0.9447 | [B] Pantene |
|  | [C] | 0.8102 | 0.9447 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.3716 | 0.5444 | [A] BC-1 |
|  | [B] | 0.3716 | ------ | 0.1980 | [B] Pantene |
|  | [C] | 0.5444 | 0.1980 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 9a. Log Squalene***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | 4.104 | 12700.0 | 0.049 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | 4.059 | 11444.8 | 0.049 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 3.988 | 9724.36 | 0.069 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 4.032 | 10755.9 | 0.049 | -1881.2 | 0.08 | -14.89 | 7.64 |
|  | 56 | [B] Pantene | a | 3.894 | 7831.85 | 0.049 | -3333.3 | <.01\* | -29.85 | 6.41 |
|  | 26 | [C] NonDandruff Pantene | ab | 3.954 | 8988.44 | 0.073 | -358.82 | 0.77 | -3.84 | 12.96 |
|  | | | | | | | | | | |
| Week 16 | 53 | [A] BC-1 | a | 3.826 | 6703.66 | 0.048 | -5607.9 | <.01\* | -45.55 | 6.57 |
|  | 54 | [B] Pantene | a | 3.716 | 5204.96 | 0.048 | -5897.5 | <.01\* | -53.12 | 5.61 |
|  | 22 | [C] NonDandruff Pantene | a | 3.737 | 5461.05 | 0.075 | -3581.2 | <.01\* | -39.61 | 11.35 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 14AUG2012 3:32 PM | | | | | | | | | | |

***Table 9b. Log Squalene***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.5148 | 0.1736 | [A] BC-1 |
|  | [B] | 0.5148 | ------ | 0.4056 | [B] Pantene |
|  | [C] | 0.1736 | 0.4056 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.1332 | 0.4570 | [A] BC-1 |
|  | [B] | 0.1332 | ------ | 0.0555+ | [B] Pantene |
|  | [C] | 0.4570 | 0.0555+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.3781 | 0.6442 | [A] BC-1 |
|  | [B] | 0.3781 | ------ | 0.2566 | [B] Pantene |
|  | [C] | 0.6442 | 0.2566 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 14AUG2012 3:32 PM | | | | | |

***Table 9c. Log Squalene***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.5148 | 0.1736 | [A] BC-1 |
|  | [B] | 0.5148 | ------ | 0.4056 | [B] Pantene |
|  | [C] | 0.1736 | 0.4056 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0486\* | 0.3743 | [A] BC-1 |
|  | [B] | 0.0486\* | ------ | 0.4975 | [B] Pantene |
|  | [C] | 0.3743 | 0.4975 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.1077 | 0.3197 | [A] BC-1 |
|  | [B] | 0.1077 | ------ | 0.8148 | [B] Pantene |
|  | [C] | 0.3197 | 0.8148 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

Appendix III

***Table 10a. Log EndPtFtz NormalizedAdjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 55 | [A] BC-1 | a | 1.250 | 17.798 | 0.050 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | a | 1.280 | 19.059 | 0.051 | 0.000 | ------ | 0.00 | . |
|  | 25 | [C] NonDandruff Pantene | a | 1.309 | 20.384 | 0.075 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 55 | [A] BC-1 | a | 1.320 | 20.897 | 0.051 | 3.111 | 0.2752 | 17.49 | 17.22 |
|  | 53 | [B] Pantene | a | 1.265 | 18.406 | 0.052 | -0.779 | 0.7871 | -4.06 | 14.34 |
|  | 25 | [C] NonDandruff Pantene | a | 1.251 | 17.832 | 0.076 | -2.548 | 0.5397 | -12.50 | 19.08 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 1.400 | 25.119 | 0.056 | 7.499 | 0.0320\* | 42.56 | 23.32 |
|  | 53 | [B] Pantene | a | 1.370 | 23.463 | 0.057 | 4.911 | 0.1588 | 26.47 | 20.92 |
|  | 22 | [C] NonDandruff Pantene | a | 1.463 | 29.060 | 0.089 | 12.643 | 0.0283\* | 77.01 | 45.62 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 24JUL2012 11:07 AM | | | | | | | | | | |

***Table 10b. Log EndPtFtz Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6784 | 0.5149 | [A] BC-1 |
|  | [B] | 0.6784 | ------ | 0.7475 | [B] Pantene |
|  | [C] | 0.5149 | 0.7475 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.3381 | 0.2634 | [A] BC-1 |
|  | [B] | 0.3381 | ------ | 0.7231 | [B] Pantene |
|  | [C] | 0.2634 | 0.7231 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.6058 | 0.4778 | [A] BC-1 |
|  | [B] | 0.6058 | ------ | 0.2719 | [B] Pantene |
|  | [C] | 0.4778 | 0.2719 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 10c. Log EndPtFtz Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6784 | 0.5149 | [A] BC-1 |
|  | [B] | 0.6784 | ------ | 0.7475 | [B] Pantene |
|  | [C] | 0.5149 | 0.7475 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.4500 | 0.4519 | [A] BC-1 |
|  | [B] | 0.4500 | ------ | 0.8810 | [B] Pantene |
|  | [C] | 0.4519 | 0.8810 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.7129 | 0.5494 | [A] BC-1 |
|  | [B] | 0.7129 | ------ | 0.3822 | [B] Pantene |
|  | [C] | 0.5494 | 0.3822 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 11a. Log WellScanFtz Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 55 | [A] BC-1 | a | 2.435 | 272.091 | 0.034 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | a | 2.419 | 262.699 | 0.034 | 0.000 | ------ | 0.00 | . |
|  | 25 | [C] NonDandruff Pantene | a | 2.433 | 270.886 | 0.050 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 55 | [A] BC-1 | a | 2.451 | 282.212 | 0.038 | 10.208 | 0.6424 | 3.75 | 8.15 |
|  | 53 | [B] Pantene | a | 2.444 | 278.171 | 0.039 | 15.561 | 0.4776 | 5.93 | 8.49 |
|  | 25 | [C] NonDandruff Pantene | a | 2.394 | 247.640 | 0.056 | -23.267 | 0.4445 | -8.59 | 10.69 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 2.543 | 348.862 | 0.036 | 86.649 | 0.0067\* | 33.05 | 13.77 |
|  | 53 | [B] Pantene | a | 2.489 | 308.580 | 0.036 | 57.757 | 0.0512 | 23.03 | 12.88 |
|  | 22 | [C] NonDandruff Pantene | a | 2.509 | 322.511 | 0.057 | 78.424 | 0.0897 | 32.13 | 21.55 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 24JUL2012 11:07 AM | | | | | | | | | | |

***Table 11b. Log WellScanFtz Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7516 | 0.9747 | [A] BC-1 |
|  | [B] | 0.7516 | ------ | 0.8268 | [B] Pantene |
|  | [C] | 0.9747 | 0.8268 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.8551 | 0. 3711 | [A] BC-1 |
|  | [B] | 0.8551 | ------ | 0. 3013 | [B] Pantene |
|  | [C] | 0. 3711 | 0. 3013 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0. 5895 | 0. 9726 | [A] BC-1 |
|  | [B] | 0. 5895 | ------ | 0. 7069 | [B] Pantene |
|  | [C] | 0. 9726 | 0. 7069 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 11c. Log WellScanFtz Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.7516 | 0.9747 | [A] BC-1 |
|  | [B] | 0.7516 | ------ | 0.8268 | [B] Pantene |
|  | [C] | 0.9747 | 0.8268 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.9077 | 0.4029 | [A] BC-1 |
|  | [B] | 0.9077 | ------ | 0.4590 | [B] Pantene |
|  | [C] | 0.4029 | 0.4590 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.2981 | 0.6113 | [A] BC-1 |
|  | [B] | 0.2981 | ------ | 0.7760 | [B] Pantene |
|  | [C] | 0.6113 | 0.7760 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 10d. Log EndPtFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 55 | [A] BC-1 | b | 2.794 | 622.094 | 0.061 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | b | 2.778 | 599.729 | 0.062 | 0.000 | ------ | 0.00 | . |
|  | 25 | [C] NonDandruff Pantene | a | 2.432 | 270.649 | 0.091 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 55 | [A] BC-1 | b | 2.595 | 393.428 | 0.056 | -228.67 | <.01\* | -36.76 | 10.19 |
|  | 54 | [B] Pantene | b | 2.601 | 398.647 | 0.056 | -201.08 | 0.01\* | -33.47 | 10.83 |
|  | 25 | [C] NonDandruff Pantene | a | 2.366 | 232.040 | 0.083 | -38.609 | 0.52 | -14.30 | 20.56 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 2.510 | 323.745 | 0.064 | -332.97 | <.01\* | -50.68 | 8.49 |
|  | 54 | [B] Pantene | b | 2.747 | 558.551 | 0.064 | -33.002 | 0.74 | -5.59 | 16.27 |
|  | 22 | [C] NonDandruff Pantene | ab | 2.552 | 356.608 | 0.101 | 121.588 | 0.13 | 51.71 | 41.16 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 21AUG2012 5:03 PM | | | | | | | | | | |

***Table 10e. Log EndPtFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8546 | 0.0012\* | [A] BC-1 |
|  | [B] | 0.8546 | ------ | 0.0020\* | [B] Pantene |
|  | [C] | 0.0012\* | 0.0020\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.8281 | 0.2937 | [A] BC-1 |
|  | [B] | 0.8281 | ------ | 0.3807 | [B] Pantene |
|  | [C] | 0.2937 | 0.3807 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0086\* | 0.0007\* | [A] BC-1 |
|  | [B] | 0.0086\* | ------ | 0.1421 | [B] Pantene |
|  | [C] | 0.0007\* | 0.1421 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 21AUG2012 5:03 PM | | | | | |

***Table 10f. Log EndPtFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8546 | 0.0012\* | [A] BC-1 |
|  | [B] | 0.8546 | ------ | 0.0020\* | [B] Pantene |
|  | [C] | 0.0012\* | 0.0020\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.9424 | 0.0231\* | [A] BC-1 |
|  | [B] | 0.9424 | ------ | 0.0202\* | [B] Pantene |
|  | [C] | 0.0231\* | 0.0202\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0099\* | 0.7255 | [A] BC-1 |
|  | [B] | 0.0099\* | ------ | 0.1057 | [B] Pantene |
|  | [C] | 0.7255 | 0.1057 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 11d. Log WellScanFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 55 | [A] BC-1 | b | 3.978 | 9510.58 | 0.040 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | b | 3.917 | 8266.23 | 0.040 | 0.000 | ------ | 0.00 | . |
|  | 25 | [C] NonDandruff Pantene | a | 3.556 | 3596.64 | 0.059 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 55 | [A] BC-1 | b | 3.725 | 5312.82 | 0.038 | -4197.8 | <.01\* | -44.15 | 5.15 |
|  | 54 | [B] Pantene | b | 3.781 | 6038.47 | 0.038 | -2227.8 | <.01\* | -26.89 | 6.81 |
|  | 25 | [C] NonDandruff Pantene | a | 3.508 | 3222.78 | 0.056 | -373.86 | 0.43 | -10.46 | 12.30 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 3.653 | 4496.67 | 0.045 | -5275.6 | <.01\* | -53.97 | 4.91 |
|  | 54 | [B] Pantene | b | 3.871 | 7435.88 | 0.046 | -610.67 | 0.46 | -7.53 | 9.88 |
|  | 22 | [C] NonDandruff Pantene | a | 3.598 | 3961.78 | 0.072 | 463.774 | 0.46 | 13.24 | 19.05 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 21AUG2012 5:03 PM | | | | | | | | | | |

***Table 11e. Log WellScanFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.2843 | <.0001\* | [A] BC-1 |
|  | [B] | 0.2843 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0427\* | 0.0049\* | [A] BC-1 |
|  | [B] | 0.0427\* | ------ | 0.2198 | [B] Pantene |
|  | [C] | 0.0049\* | 0.2198 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.3087 | [B] Pantene |
|  | [C] | <.0001\* | 0.3087 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 21AUG2012 5:03 PM | | | | | |

***Table 11f. Log WellScanFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.2843 | <.0001\* | [A] BC-1 |
|  | [B] | 0.2843 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.3013 | 0.0017\* | [A] BC-1 |
|  | [B] | 0.3013 | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.0017\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0009\* | 0.5180 | [A] BC-1 |
|  | [B] | 0.0009\* | ------ | 0.0017\* | [B] Pantene |
|  | [C] | 0.5180 | 0.0017\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 12a. Log ProteinFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 55 | [A] BC-1 | b | 1.543 | 34.954 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | b | 1.498 | 31.467 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 25 | [C] NonDandruff Pantene | a | 1.123 | 13.277 | 0.067 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 55 | [A] BC-1 | ab | 1.275 | 18.816 | 0.047 | -16.140 | <.0001\* | -46.17 | 5.45 |
|  | 53 | [B] Pantene | b | 1.329 | 21.314 | 0.048 | -10.139 | 0.0002\* | -32.24 | 7.00 |
|  | 25 | [C] NonDandruff Pantene | a | 1.114 | 12.993 | 0.070 | -0.272 | 0.8863 | -2.05 | 14.77 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 1.110 | 12.886 | 0.048 | -24.364 | <.0001\* | -65.41 | 4.56 |
|  | 53 | [B] Pantene | b | 1.378 | 23.866 | 0.049 | -8.180 | 0.0287\* | -25.53 | 9.93 |
|  | 22 | [C] NonDandruff Pantene | a | 1.089 | 12.272 | 0.076 | -2.047 | 0.4564 | -14.30 | 17.80 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 24JUL2012 11:07 AM | | | | | | | | | | |

***Table 12b. Log ProteinFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4747 | <.0001\* | [A] BC-1 |
|  | [B] | 0.4747 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0. 1152 | 0. 0013\* | [A] BC-1 |
|  | [B] | 0.1152 | ------ | 0. 0455\* | [B] Pantene |
|  | [C] | 0. 0013\* | 0. 0455\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | 0. 0003\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0. 5711 | [B] Pantene |
|  | [C] | 0. 0003\* | 0. 5711 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 12c. Log ProteinFtz***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4747 | <.0001\* | [A] BC-1 |
|  | [B] | 0.4747 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.4244 | 0.0601+ | [A] BC-1 |
|  | [B] | 0.4244 | ------ | 0.0129\* | [B] Pantene |
|  | [C] | 0.0601+ | 0.0129\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0001\* | 0.8135 | [A] BC-1 |
|  | [B] | 0.0001\* | ------ | 0.0017\* | [B] Pantene |
|  | [C] | 0.8135 | 0.0017\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Appendix IV***

***Table 13a. Log Histamine Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | -0.502 | 0.315 | 0.130 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | -0.576 | 0.265 | 0.130 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | -0.789 | 0.162 | 0.184 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | -0.967 | 0.108 | 0.128 | -0.202 | <.01\* | -65.09 | 6.89 |
|  | 56 | [B] Pantene | a | -0.718 | 0.191 | 0.130 | -0.050 | 0.25 | -20.75 | 15.92 |
|  | 26 | [C] NonDandruff Pantene | a | -0.944 | 0.114 | 0.192 | -0.008 | 0.83 | -6.24 | 27.78 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | -0.971 | 0.107 | 0.133 | -0.197 | <.01\* | -64.84 | 9.74 |
|  | 54 | [B] Pantene | a | -0.646 | 0.226 | 0.134 | -0.006 | 0.93 | -2.50 | 27.26 |
|  | 22 | [C] NonDandruff Pantene | a | -0.770 | 0.170 | 0.211 | 0.077 | 0.17 | 82.81 | 80.31 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 20AUG2012 11:53 AM | | | | | | | | | | |

***Table 13b. Log Histamine Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6873 | 0.2047 | [A] BC-1 |
|  | [B] | 0.6873 | ------ | 0.3465 | [B] Pantene |
|  | [C] | 0.2047 | 0.3465 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0042\* | 0.0062\* | [A] BC-1 |
|  | [B] | 0.0042\* | ------ | 0.6376 | [B] Pantene |
|  | [C] | 0.0062\* | 0.6376 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0107\* | 0.0019\* | [A] BC-1 |
|  | [B] | 0.0107\* | ------ | 0.2291 | [B] Pantene |
|  | [C] | 0.0019\* | 0.2291 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 20AUG2012 11:53 AM | | | | | |

***Table 13c. Log Histamine Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6873 | 0.2047 | [A] BC-1 |
|  | [B] | 0.6873 | ------ | 0.3465 | [B] Pantene |
|  | [C] | 0.2047 | 0.3465 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.1761 | 0.9215 | [A] BC-1 |
|  | [B] | 0.1761 | ------ | 0.3324 | [B] Pantene |
|  | [C] | 0.9215 | 0.3324 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0883+ | 0.4229 | [A] BC-1 |
|  | [B] | 0.0883+ | ------ | 0.6200 | [B] Pantene |
|  | [C] | 0.4229 | 0.6200 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 14a. Log ProteinHistamine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.226 | 16.815 | 0.042 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 1.143 | 13.911 | 0.042 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.699 | 5.002 | 0.059 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 0.930 | 8.517 | 0.038 | -8.252 | <.01\* | -49.18 | 4.94 |
|  | 56 | [B] Pantene | b | 1.003 | 10.072 | 0.039 | -4.130 | <.01\* | -29.04 | 7.02 |
|  | 26 | [C] NonDandruff Pantene | a | 0.757 | 5.720 | 0.057 | 0.628 | 0.43 | 12.46 | 16.41 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.840 | 6.918 | 0.043 | -9.993 | <.01\* | -59.07 | 4.42 |
|  | 54 | [B] Pantene | b | 1.040 | 10.962 | 0.043 | -3.785 | <.01\* | -25.70 | 8.10 |
|  | 22 | [C] NonDandruff Pantene | a | 0.782 | 6.055 | 0.068 | 1.112 | 0.24 | 22.46 | 20.98 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 20AUG2012 11:53 AM | | | | | | | | | | |

***Table 14b. Log ProteinHistamine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1666 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1666 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0174\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0174\* | ------ | 0.0100\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0100\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0002\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0002\* | ------ | 0.0152\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0152\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 20AUG2012 11:53 AM | | | | | |

***Table 14c. Log ProteinHistamine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1666 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1666 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.1830 | 0.0130\* | [A] BC-1 |
|  | [B] | 0.1830 | ------ | 0.0005\* | [B] Pantene |
|  | [C] | 0.0130\* | 0.0005\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0012\* | 0.4696 | [A] BC-1 |
|  | [B] | 0.0012\* | ------ | 0.0016\* | [B] Pantene |
|  | [C] | 0.4696 | 0.0016\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Appendix V***

***Table 15a. Log IL1a Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | 0.536 | 3.435 | 0.048 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | 0.552 | 3.567 | 0.048 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | b | 0.809 | 6.447 | 0.068 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 0.616 | 4.130 | 0.051 | 0.687 | 0.03\* | 19.95 | 9.82 |
|  | 56 | [B] Pantene | a | 0.574 | 3.749 | 0.051 | 0.314 | 0.30 | 9.14 | 9.09 |
|  | 26 | [C] NonDandruff Pantene | a | 0.727 | 5.328 | 0.076 | -0.650 | 0.35 | -10.87 | 10.95 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.690 | 4.900 | 0.047 | 1.431 | <.01\* | 41.25 | 13.13 |
|  | 54 | [B] Pantene | a | 0.558 | 3.611 | 0.048 | 0.295 | 0.36 | 8.89 | 10.22 |
|  | 22 | [C] NonDandruff Pantene | a | 0.721 | 5.256 | 0.075 | -0.454 | 0.57 | -7.96 | 13.57 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 29AUG2012 4:50 PM | | | | | | | | | | |

***Table 15b. Log IL1a Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8106 | 0.0013\* | [A] BC-1 |
|  | [B] | 0.8106 | ------ | 0.0025\* | [B] Pantene |
|  | [C] | 0.0013\* | 0.0025\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.4134 | 0.0452\* | [A] BC-1 |
|  | [B] | 0.4134 | ------ | 0.1746 | [B] Pantene |
|  | [C] | 0.0452\* | 0.1746 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0511+ | 0.0151\* | [A] BC-1 |
|  | [B] | 0.0511+ | ------ | 0.3352 | [B] Pantene |
|  | [C] | 0.0151\* | 0.3352 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 15c. Log IL1a Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8106 | 0.0013\* | [A] BC-1 |
|  | [B] | 0.8106 | ------ | 0.0025\* | [B] Pantene |
|  | [C] | 0.0013\* | 0.0025\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.5609 | 0.2268 | [A] BC-1 |
|  | [B] | 0.5609 | ------ | 0.0979+ | [B] Pantene |
|  | [C] | 0.2268 | 0.0979+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0511+ | 0.7324 | [A] BC-1 |
|  | [B] | 0.0511+ | ------ | 0.0694+ | [B] Pantene |
|  | [C] | 0.7324 | 0.0694+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 16a. Log IL1ra Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.684 | 48.295 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 1.653 | 44.950 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 1.276 | 18.886 | 0.063 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 1.467 | 29.284 | 0.044 | -21.139 | <.01\* | -41.92 | 4.77 |
|  | 56 | [B] Pantene | c | 1.604 | 40.175 | 0.045 | -4.902 | 0.17 | -10.87 | 7.44 |
|  | 26 | [C] NonDandruff Pantene | a | 1.280 | 19.071 | 0.066 | 0.218 | 0.92 | 1.16 | 12.46 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 1.058 | 11.429 | 0.059 | -38.461 | <.01\* | -77.09 | 3.05 |
|  | 54 | [B] Pantene | b | 1.588 | 38.766 | 0.060 | -7.948 | 0.17 | -17.01 | 11.15 |
|  | 22 | [C] NonDandruff Pantene | a | 1.044 | 11.062 | 0.094 | -7.003 | 0.02\* | -38.76 | 12.92 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 29AUG2012 4:50 PM | | | | | | | | | | |

***Table 16b. Log IL1ra Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6235 | <.0001\* | [A] BC-1 |
|  | [B] | 0.6235 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0004\* | 0.0003\* | [A] BC-1 |
|  | [B] | 0.0004\* | ------ | 0.3923 | [B] Pantene |
|  | [C] | 0.0003\* | 0.3923 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | 0.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.2284 | [B] Pantene |
|  | [C] | 0.0001\* | 0.2284 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 16c. Log IL1ra Normalized***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6235 | <.0001\* | [A] BC-1 |
|  | [B] | 0.6235 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0307\* | 0.0205\* | [A] BC-1 |
|  | [B] | 0.0307\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.0205\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | 0.8984 | [A] BC-1 |
|  | [B] | <.0001\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.8984 | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 17a. Log IL1ra:IL1a Ratio***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.148 | 14.059 | 0.073 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 1.100 | 12.602 | 0.073 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.467 | 2.929 | 0.104 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 0.851 | 7.091 | 0.073 | -7.555 | <.01\* | -51.58 | 4.90 |
|  | 56 | [B] Pantene | b | 1.030 | 10.718 | 0.074 | -2.407 | 0.05 | -18.34 | 8.40 |
|  | 26 | [C] NonDandruff Pantene | a | 0.554 | 3.579 | 0.109 | 0.426 | 0.40 | 13.50 | 17.23 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.368 | 2.332 | 0.077 | -12.050 | <.01\* | -83.78 | 2.70 |
|  | 54 | [B] Pantene | b | 1.031 | 10.737 | 0.078 | -3.352 | 0.11 | -23.79 | 12.80 |
|  | 22 | [C] NonDandruff Pantene | a | 0.323 | 2.105 | 0.123 | -1.052 | 0.13 | -33.32 | 17.59 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 29AUG2012 4:50 PM | | | | | | | | | | |

***Table 17b. Log IL1ra:IL1a Ratio***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6479 | <.0001\* | [A] BC-1 |
|  | [B] | 0.6479 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0004\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0004\* | ------ | 0.0740+ | [B] Pantene |
|  | [C] | <.0001\* | 0.0740+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.6699 | [B] Pantene |
|  | [C] | <.0001\* | 0.6699 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 17c. Log IL1ra:IL1a Ratio***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.6479 | <.0001\* | [A] BC-1 |
|  | [B] | 0.6479 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0856+ | 0.0248\* | [A] BC-1 |
|  | [B] | 0.0856+ | ------ | 0.0004\* | [B] Pantene |
|  | [C] | 0.0248\* | 0.0004\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | 0.7584 | [A] BC-1 |
|  | [B] | <.0001\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.7584 | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 18a. Log ProteinCytokine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.076 | 11.916 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 0.994 | 9.856 | 0.045 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.516 | 3.283 | 0.063 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 0.733 | 5.412 | 0.043 | -6.374 | <.01\* | -54.08 | 4.54 |
|  | 56 | [B] Pantene | b | 0.792 | 6.195 | 0.044 | -3.806 | <.01\* | -38.06 | 6.23 |
|  | 26 | [C] NonDandruff Pantene | a | 0.518 | 3.298 | 0.065 | 0.015 | 0.98 | 0.46 | 14.91 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.612 | 4.090 | 0.046 | -8.009 | <.01\* | -66.19 | 3.77 |
|  | 54 | [B] Pantene | b | 0.830 | 6.759 | 0.047 | -3.758 | <.01\* | -35.73 | 7.24 |
|  | 22 | [C] NonDandruff Pantene | a | 0.461 | 2.891 | 0.073 | -0.553 | 0.32 | -16.05 | 14.85 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 29AUG2012 4:50 PM | | | | | | | | | | |

***Table 18b. Log ProteinCytokine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1928 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1928 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0. 0364\* | <.0001\* | [A] BC-1 |
|  | [B] | 0. 0364\* | ------ | 0.0078\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0078\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.2047 | [B] Pantene |
|  | [C] | <.0001\* | 0.2047 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker. diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 18c. Log ProteinCytokine***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1928 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1928 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.3443 | 0.0067\* | [A] BC-1 |
|  | [B] | 0.3443 | ------ | 0.0007\* | [B] Pantene |
|  | [C] | 0.0067\* | 0.0007\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0012\* | 0.0840+ | [A] BC-1 |
|  | [B] | 0.0012\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.0840+ | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Appendix VI***

***Table 19a. Log HsaNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 0.892 | 7.803 | 0.072 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 0.774 | 5.937 | 0.072 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.507 | 3.216 | 0.102 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 0.620 | 4.169 | 0.074 | -3.559 | <.01\* | -46.05 | 10.65 |
|  | 56 | [B] Pantene | a | 0.763 | 5.796 | 0.075 | -0.662 | 0.59 | -10.26 | 18.02 |
|  | 26 | [C] NonDandruff Pantene | a | 0.526 | 3.357 | 0.110 | 0.210 | 0.83 | 6.66 | 31.59 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.520 | 3.308 | 0.075 | -4.737 | <.01\* | -58.89 | 8.73 |
|  | 54 | [B] Pantene | b | 0.930 | 8.518 | 0.076 | 1.689 | 0.30 | 24.74 | 26.75 |
|  | 22 | [C] NonDandruff Pantene | a | 0.391 | 2.461 | 0.119 | -0.457 | 0.61 | -15.67 | 28.41 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 19b. Log HsaNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.2443 | 0.0024\* | [A] BC-1 |
|  | [B] | 0.2443 | ------ | 0.0341\* | [B] Pantene |
|  | [C] | 0.0024\* | 0.0341\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0730+ | 0.0572+ | [A] BC-1 |
|  | [B] | 0.0730+ | ------ | 0.6286 | [B] Pantene |
|  | [C] | 0.0572+ | 0.6286 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0003\* | 0.0738+ | [A] BC-1 |
|  | [B] | 0.0003\* | ------ | 0.3272 | [B] Pantene |
|  | [C] | 0.0738+ | 0.3272 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 19c. Log HsaNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.2443 | 0.0024\* | [A] BC-1 |
|  | [B] | 0.2443 | ------ | 0.0341\* | [B] Pantene |
|  | [C] | 0.0024\* | 0.0341\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.1755 | 0.4790 | [A] BC-1 |
|  | [B] | 0.1755 | ------ | 0.0775+ | [B] Pantene |
|  | [C] | 0.4790 | 0.0775+ | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0002\* | 0.3641 | [A] BC-1 |
|  | [B] | 0.0002\* | ------ | 0.0002\* | [B] Pantene |
|  | [C] | 0.3641 | 0.0002\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 20a. Log InvolucrinNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | -1.359 | 0.044 | 0.053 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | -1.346 | 0.045 | 0.053 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | -1.489 | 0.032 | 0.075 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | -1.499 | 0.032 | 0.053 | -0.012 | 0.02\* | -26.89 | 9.66 |
|  | 56 | [B] Pantene | b | -1.270 | 0.054 | 0.054 | 0.005 | 0.45 | 10.66 | 14.88 |
|  | 26 | [C] NonDandruff Pantene | a | -1.535 | 0.029 | 0.080 | -0.003 | 0.64 | -9.01 | 18.04 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | -1.665 | 0.022 | 0.059 | -0.022 | <.01\* | -50.68 | 7.17 |
|  | 54 | [B] Pantene | b | -1.434 | 0.037 | 0.059 | -0.012 | 0.05 | -25.01 | 11.01 |
|  | 22 | [C] NonDandruff Pantene | a | -1.711 | 0.019 | 0.093 | -0.009 | 0.10 | -31.61 | 15.77 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 20b. Log InvolucrinNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8618 | 0.1550 | [A] BC-1 |
|  | [B] | 0.8618 | ------ | 0.1183 | [B] Pantene |
|  | [C] | 0.1550 | 0.1183 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0297\* | 0.3594 | [A] BC-1 |
|  | [B] | 0.0297\* | ------ | 0.4162 | [B] Pantene |
|  | [C] | 0.3594 | 0.4162 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0443\* | 0.2318 | [A] BC-1 |
|  | [B] | 0.0443\* | ------ | 0.7362 | [B] Pantene |
|  | [C] | 0.2318 | 0.7362 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 20c. Log InvolucrinNrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.8618 | 0.1550 | [A] BC-1 |
|  | [B] | 0.8618 | ------ | 0.1183 | [B] Pantene |
|  | [C] | 0.1550 | 0.1183 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0032\* | 0.7023 | [A] BC-1 |
|  | [B] | 0.0032\* | ------ | 0.0068\* | [B] Pantene |
|  | [C] | 0.7023 | 0.0068\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0064\* | 0.6778 | [A] BC-1 |
|  | [B] | 0.0064\* | ------ | 0.0132\* | [B] Pantene |
|  | [C] | 0.6778 | 0.0132\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 21a. Log Keratins110Nrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | a | 0.991 | 9.806 | 0.081 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | a | 1.148 | 14.068 | 0.081 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | b | 1.637 | 43.326 | 0.115 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | a | 1.318 | 20.778 | 0.074 | 10.578 | <.01\* | 103.70 | 39.75 |
|  | 56 | [B] Pantene | a | 1.191 | 15.537 | 0.075 | 2.190 | 0.45 | 16.41 | 23.12 |
|  | 26 | [C] NonDandruff Pantene | b | 1.727 | 53.345 | 0.111 | 12.221 | 0.38 | 29.72 | 37.98 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | b | 1.509 | 32.261 | 0.080 | 22.269 | <.01\* | 222.85 | 69.70 |
|  | 54 | [B] Pantene | a | 1.127 | 13.391 | 0.081 | 0.980 | 0.73 | 7.89 | 23.51 |
|  | 22 | [C] NonDandruff Pantene | b | 1.644 | 44.029 | 0.127 | 7.068 | 0.61 | 19.12 | 40.78 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 21b. Log Keratins110Nrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1734 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1734 | ------ | 0.0007\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0007\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0465\* | 0.2010 | [A] BC-1 |
|  | [B] | 0.0465\* | ------ | 0.7612 | [B] Pantene |
|  | [C] | 0.2010 | 0.7612 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0005\* | 0.0152\* | [A] BC-1 |
|  | [B] | 0.0005\* | ------ | 0.8049 | [B] Pantene |
|  | [C] | 0.0152\* | 0.8049 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 21c. Log Keratins110Nrm***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1734 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1734 | ------ | 0.0007\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0007\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.2334 | 0.0026\* | [A] BC-1 |
|  | [B] | 0.2334 | ------ | 0.0001\* | [B] Pantene |
|  | [C] | 0.0026\* | 0.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0010\* | 0.3680 | [A] BC-1 |
|  | [B] | 0.0010\* | ------ | 0.0008\* | [B] Pantene |
|  | [C] | 0.3680 | 0.0008\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 22a. Log ProteinSkinMap***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 60 | [A] BC-1 | b | 1.092 | 12.355 | 0.055 | 0.000 | ------ | 0.00 | . |
|  | 60 | [B] Pantene | b | 0.982 | 9.589 | 0.055 | 0.000 | ------ | 0.00 | . |
|  | 30 | [C] NonDandruff Pantene | a | 0.497 | 3.138 | 0.078 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 0.741 | 5.503 | 0.054 | -6.648 | <.01\* | -54.71 | 5.90 |
|  | 56 | [B] Pantene | c | 0.896 | 7.874 | 0.055 | -1.702 | 0.14 | -17.78 | 10.91 |
|  | 26 | [C] NonDandruff Pantene | a | 0.402 | 2.523 | 0.081 | -0.639 | 0.25 | -20.20 | 15.61 |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 0.606 | 4.033 | 0.058 | -8.430 | <.01\* | -67.64 | 4.72 |
|  | 54 | [B] Pantene | b | 0.929 | 8.494 | 0.058 | -1.695 | 0.22 | -16.63 | 12.28 |
|  | 22 | [C] NonDandruff Pantene | a | 0.586 | 3.853 | 0.091 | 0.528 | 0.53 | 15.88 | 26.81 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 22b. Log ProteinSkinMap***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1618 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1618 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0016\* | 0.0170\* | [A] BC-1 |
|  | [B] | 0.0016\* | ------ | 0.8988 | [B] Pantene |
|  | [C] | 0.0170\* | 0.8988 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.2321 | [B] Pantene |
|  | [C] | <.0001\* | 0.2321 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker diff.sas 24JUL2012 11:07 AM | | | | | |

***Table 22c. Log ProteinSkinMap***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.1618 | <.0001\* | [A] BC-1 |
|  | [B] | 0.1618 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0458\* | 0.0007\* | [A] BC-1 |
|  | [B] | 0.0458\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | 0.0007\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0001\* | 0.8546 | [A] BC-1 |
|  | [B] | 0.0001\* | ------ | 0.0019\* | [B] Pantene |
|  | [C] | 0.8546 | 0.0019\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Appendix VII***

***Table 23a. Log CysteicAcid***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 57 | [A] BC-1 | a | 4.251 | 17812.9 | 0.038 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | b | 4.368 | 23326.1 | 0.039 | 0.000 | ------ | 0.00 | . |
|  | 22 | [C] NonDandruff Pantene | ab | 4.365 | 23194.0 | 0.061 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 4.045 | 11101.3 | 0.046 | -6861.5 | <.01\* | -38.20 | 7.63 |
|  | 54 | [B] Pantene | ab | 4.166 | 14641.0 | 0.047 | -8670.5 | <.01\* | -37.19 | 7.83 |
|  | 22 | [C] NonDandruff Pantene | b | 4.243 | 17495.9 | 0.073 | -5674.7 | 0.15 | -24.49 | 14.78 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 23b. Log CysteicAcid***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.0329\* | 0.1131 | [A] BC-1 |
|  | [B] | 0.0329\* | ------ | 0.9729 | [B] Pantene |
|  | [C] | 0.1131 | 0.9729 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.9702 | 0.4065 | [A] BC-1 |
|  | [B] | 0.9702 | ------ | 0.4260 | [B] Pantene |
|  | [C] | 0.4065 | 0.4260 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose\ CRB11-12-149 MBV Biomarker13AUG2012 3:46 PM | | | | | |

***Table 23c. Log CysteicAcid***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.0329\* | 0.1131 | [A] BC-1 |
|  | [B] | 0.0329\* | ------ | 0.9729 | [B] Pantene |
|  | [C] | 0.1131 | 0.9729 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0698+ | 0.0243\* | [A] BC-1 |
|  | [B] | 0.0698+ | ------ | 0.3750 | [B] Pantene |
|  | [C] | 0.0243\* | 0.3750 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

***Table 24a. Log(CysAcid:HrWeight)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Geometric Mean** | **Std. Error** | **Geometric Mean CFB** | **P-Value** | **% Mean CFB** | **S.E. %CFB** |
| Baseline | 57 | [A] BC-1 | a | 3.332 | 2147.27 | 0.037 | 0.000 | ------ | 0.00 | . |
|  | 54 | [B] Pantene | b | 3.436 | 2730.74 | 0.038 | 0.000 | ------ | 0.00 | . |
|  | 22 | [C] NonDandruff Pantene | ab | 3.441 | 2760.11 | 0.059 | 0.000 | ------ | 0.00 | . |
|  | | | | | | | | | | |
| Week 16 | 55 | [A] BC-1 | a | 3.083 | 1209.27 | 0.046 | -971.06 | <.01\* | -44.54 | 6.83 |
|  | 54 | [B] Pantene | ab | 3.206 | 1608.39 | 0.046 | -1116.8 | <.01\* | -40.98 | 7.33 |
|  | 22 | [C] NonDandruff Pantene | b | 3.277 | 1890.59 | 0.073 | -867.43 | 0.06 | -31.45 | 13.38 |
|  | | | | | | | | | | |
| \* Treatments with the same grouping letter are not significantly different from each other at alpha=0.05. Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | | | | | | |

***Table 24b. Log(CysAcid:HrWeight)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean(at Baseline) and Change from Baseline (at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.0484\* | 0.1183 | [A] BC-1 |
|  | [B] | 0.0484\* | ------ | 0.9471 | [B] Pantene |
|  | [C] | 0.1183 | 0.9471 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.7256 | 0.3581 | [A] BC-1 |
|  | [B] | 0.7256 | ------ | 0.5143 | [B] Pantene |
|  | [C] | 0.3581 | 0.5143 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ...\CRB 11-12-149 Oxidative Damage - Maaike Bose program:  ...\CRB 11-12-149 Oxidative Damage - Maaike Bose \program\CRB11-12-149 MBV Biomarker.sas 16AUG2012 4:58 PM | | | | | |

***Table 24c. Log(CysAcid:HrWeight)***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.0484\* | 0.1183 | [A] BC-1 |
|  | [B] | 0.0484\* | ------ | 0.9471 | [B] Pantene |
|  | [C] | 0.1183 | 0.9471 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.0599+ | 0.0258\* | [A] BC-1 |
|  | [B] | 0.0599+ | ------ | 0.4172 | [B] Pantene |
|  | [C] | 0.0258\* | 0.4172 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: ..\MBV CRB11-12-149 Biomarker.doc program:   .\CRB11-12-149 MBV Biomarker.sas 30AUG2012 3:02 PM | | | | | |

**Appendix VIII**

***Table 25a. ASFS Total***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

|  | | | | | | **Change from Baseline** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Std. Error** | **Mean CFB** | **S.E. CFB** | **P-Value** | **% Mean CFB** |
| Baseline | 117 | [A] BC-1 | b | 34.718 | 0.545 | 0.000 | . | ------ | 0.00 |
|  | 114 | [B] Pantene | b | 35.347 | 0.552 | 0.000 | . | ------ | 0.00 |
|  | 52 | [C] NonDandruff Pantene | a | 2.692 | 0.819 | 0.000 | . | ------ | 0.00 |
|  | | | | | | | | | |
| Week 3 | 58 | [A] BC-1 | b | 26.133 | 1.043 | -8.616 | 1.07 | <.0001\* | -24.79 |
|  | 56 | [B] Pantene | c | 29.532 | 1.062 | -5.711 | 1.09 | <.0001\* | -16.20 |
|  | 26 | [C] NonDandruff Pantene | a | 3.511 | 1.566 | 0.562 | 1.60 | 0.7265 | 19.06 |
|  | | | | | | | | | |
| Week 16 | 110 | [A] BC-1 | b | 15.959 | 1.188 | -18.817 | 1.11 | <.0001\* | -54.11 |
|  | 108 | [B] Pantene | c | 27.452 | 1.200 | -7.984 | 1.12 | <.0001\* | -22.53 |
|  | 44 | [C] NonDandruff Pantene | a | 4.128 | 1.885 | 1.551 | 1.77 | 0.3805 | 60.19 |
|  | | | | | | | | | |
| \* Treatment Means with the same grouping letter are not significantly different from each other at alpha=0.05. Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose\MBV CRB11-12-149 ASFS.doc Program: ..\CRB11-12-149 MBV ASFS.sas 30AUG2012 3:48 PM | | | | | | | | | |

***Table 25b. ASFS Total***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean (at Baseline) and Change from Baseline(at post baseline points) Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4182 | <.0001\* | [A] BC-1 |
|  | [B] | 0.4182 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0588+ | <.0001\* | [A] BC-1 |
|  | [B] | 0.0588+ | ------ | 0.0015\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0015\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | 0.0018\* | [B] Pantene |
|  | [C] | <.0001\* | 0.0018\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose\MBV CRB11-12-149 ASFS.doc Program: ..\CRB11-12-149 MBV ASFS.sas 30AUG2012 3:48 PM | | | | | |

***Table 25c. ASFS Total***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.4182 | <.0001\* | [A] BC-1 |
|  | [B] | 0.4182 | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 3 | [A] | ------ | 0.0239\* | <.0001\* | [A] BC-1 |
|  | [B] | 0.0239\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | <.0001\* | <.0001\* | [A] BC-1 |
|  | [B] | <.0001\* | ------ | <.0001\* | [B] Pantene |
|  | [C] | <.0001\* | <.0001\* | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose\MBV CRB11-12-149 ASFS.doc Program: ..\CRB11-12-149 MBV ASFS.sas 30AUG2012 3:48 PM | | | | | |

**Appendix IX**

***Table 26a. Hair Weight***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Std. Error** |
| --- | --- | --- | --- | --- | --- |
| Baseline | 114 | [A] BC-1 | a | 0.551 | 0.045 |
|  | 108 | [B] Pantene | a | 0.514 | 0.046 |
|  | 44 | [C] NonDandruff Pantene | a | 0.407 | 0.072 |
|  | | | | | |
| Week 16 | 114 | [A] BC-1 | a | 0.198 | 0.008 |
|  | 108 | [B] Pantene | a | 0.185 | 0.008 |
|  | 44 | [C] NonDandruff Pantene | a | 0.173 | 0.012 |
|  | | | | | |
| \* Treatment Means with the same grouping letter are not significantly different from each other at alpha=0.05. Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose  Program: ..\CRB11-12-149 MBV ASFS.sas 14AUG2012 11:39 AM | | | | | |

***Table 26b. Hair Weight***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.5628 | 0.0925+ | [A] BC-1 |
|  | [B] | 0.5628 | ------ | 0.2146 | [B] Pantene |
|  | [C] | 0.0925+ | 0.2146 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.2333 | 0.0811+ | [A] BC-1 |
|  | [B] | 0.2333 | ------ | 0.3986 | [B] Pantene |
|  | [C] | 0.0811+ | 0.3986 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose  Program: ..\CRB11-12-149 MBV ASFS.sas 14AUG2012 11:39 AM | | | | | |

***Table 27a. Hair Length***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **Treatment Phase** | **N** | **Treatment** | **Group\*** | **Mean** | **Std. Error** |
| --- | --- | --- | --- | --- | --- |
| Baseline | 114 | [A] BC-1 | a | 15.925 | 1.598 |
|  | 108 | [B] Pantene | a | 18.186 | 1.641 |
|  | 44 | [C] NonDandruff Pantene | a | 13.407 | 2.579 |
|  | | | | | |
| Week 16 | 114 | [A] BC-1 | a | 4.968 | 0.100 |
|  | 108 | [B] Pantene | a | 4.799 | 0.102 |
|  | 44 | [C] NonDandruff Pantene | a | 5.081 | 0.161 |
|  | | | | | |
| \* Treatment Means with the same grouping letter are not significantly different from each other at alpha=0.05. Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose  Program: ..\CRB11-12-149 MBV ASFS.sas 14AUG2012 11:39 AM | | | | | |

***Table 27b. Hair Length***

***Adjusted Treatment Means***

***CRB 11-12-149 Oxidative Damage***

| **P-Values for Treatment Mean Pairwise Comparisons** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Trt. Phase** | **Treatment** | **[A]** | **[B]** | **[C]** | **Treatment Code Key** |
| Baseline | [A] | ------ | 0.3253 | 0.4078 | [A] BC-1 |
|  | [B] | 0.3253 | ------ | 0.1201 | [B] Pantene |
|  | [C] | 0.4078 | 0.1201 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| Week 16 | [A] | ------ | 0.2381 | 0.5505 | [A] BC-1 |
|  | [B] | 0.2381 | ------ | 0.1405 | [B] Pantene |
|  | [C] | 0.5505 | 0.1405 | ------ | [C] NonDandruff Pantene |
|  | | | | | |
| A p-value with a '\*' indicates a significant difference between treatments  (P<=0.05). A p-value with a '+' indicates a directional difference between treatments  (0.05<P<=0.10). Source: \\Qsfiles.pg.com\beauty\_care\clinical\Biometrics\Lin Fei\2011\CRB 11-12-149 Oxidative Damage - Maaike Bose  Program: ..\CRB11-12-149 MBV ASFS.sas 14AUG2012 11:39 AM | | | | | |