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## Setting of "Hair Beauty Level" as a Comprehensive Score for Hair Beauty

~ An Analysis of the Elements Supporting Aesthetically Beautiful Hair ~

The Milbon Co., Ltd. (President and CEO: Ryuji Sato) has used the survey and analysis of the hair and scalps of 281 female members of the public to newly define a "Hair Beauty Level," providing a comprehensive evaluation of the beauty of hair.

The foundation research generally performed by Milbon naturally includes research into the varied damage and aging phenomena that affect the hair and the scalp, but additionally, sensibility research into the appearance and feel of hair also forms a vital aspect of our work. General evaluation methods are already used to comprehensively assess the condition of skin, based on factors such as "firmness" and "texture," but that kind of comprehensive evaluation score had never existed for hair. Therefore, as part of our sensibility research, this time we have set a "Hair Beauty Level" to act as a comprehensive score for the beauty of hair, and through the exhaustive investigation and analysis of correlating factors such as age and beauty regimen, we have found several factors that influence the aesthetic beauty of hair. As a result, we have identified that the key point in raising the "Hair Beauty Level" is to "frequently visit hair salon."

The knowledge acquired through this research will both be used in the planning of future products, and applied to counseling methods provided in beauty salons in order to realize the beauty of each and every woman, making a contribution to the further development of the beauty industry. These findings have been released externally as shown below.

## [External Release]

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## [Research Background]

Hair is undoubtedly very important to women, and many women are extremely invested in maintaining the beauty of their own hair. In order to provide each and every woman with an approach to beauty that matches their own lifestyle, it is absolutely vital to be able to accurately evaluate the current state of that person's hair. However, while technology already exists to take the condition of skin, such as firmness and texture, measure them mechanically for evaluation and turn them into a comprehensive beauty score, there were no methods to objectively and comprehensively evaluate the beauty of hair. The reasons for this can be considered to include (1) with the spread of chemical beauty treatments, such as hair dyeing and permanent waves, the diversification of hairstyles has continued to proceed, and (2) when it comes to methods for numerically representing the state of hair, those that measure the physical properties of the hair are more common, such as the "strength" and "friction

coefficient" of single strands of hair, meaning there are few methods of taking overall measurements.

In this research, therefore, Milbon challenged the creation of an overall evaluation of the beauty of hair based on photos taken from behind 281 women, and exhaustively investigated the correlation between a variety of parameters, including age, beauty regimen, and mechanically measured data.

#### [Research Results]

Informed consent for participation in the experiment was obtained from 281 Japanese women aged between 20 and 79, who were then photographed from behind and their aesthetic beauty evaluated completely removed from factors such as their age and beauty salon history. This comprehensive score was called the "Hair Beauty Level," and as the result of grading through discussion between seven evaluators, grading was achieved on an 8 point scale, with the cluster considered the most beautiful graded as hair beauty level 8, and the cluster the least beautiful graded as hair beauty level 1 (Fig. 1).

In order to investigate the factors supporting the acquired hair beauty levels, the correlative relationship between more than ten sensory evaluation values was investigated, including "feeling of luster" and "feeling of unity." The results indicated that, across all ages, the three most important elements for beautiful hair are "having luster," "having few grey hair," and "having few aged hair (frizzy hair caused by age)." As all of these can be predicted to be related to age, this indicates that hair beauty level decreases with age. However, when the relationship between age and hair beauty level was investigated, while a trend for it to decrease with age was observed, the distribution of hair beauty level in people in their 20s to 50s was wide, and a major difference was found in the hair beauty of women of same age (Fig. 2). This suggests the potential for suitable beauty salon treatments and daily care to maintain a higher hair beauty level when compared to other people of the same age.

Therefore, a survey was implemented with more than 100 questions concerning awareness and actions relating to hair, investigating the beauty regimen that contributes to beautiful hair in each age range. In particular, the results of the survey for women in their 50s indicated that those in the high cluster of hair beauty level 6 - 8 went to beauty salons more frequently than those of level 5 or lower (Fig. 3). There was no disparity in the amount of money spent per visit to the beauty salon, indicating that the secret to beautiful hair in the 50s is rather than spending a lot in a single visit, to visit more frequently and have proper care performed. Furthermore, many women in their 20s have long hair, and just let their hair continuously grow, but the importance of frequent haircuts to maintain the condition of the tips of the hair was also discovered.

As displayed by these results, providing suitable advice to each individual woman in order for them to change their beauty regimen holds the potential for them to achieve hair that is more beautiful than their current condition. In the future, we are planning to use the already collected photographs of thousands of further women's hair to investigate the relationship between sensory evaluation results, activities relating to beauty, and hair beauty level in more detail.



# [Reference Materials]



# Fig. 1 The Distribution of Hair beauty levels Among 281 Women

Examples of each level are displayed using two patterns, (a) low light short hair, and (b) high light long hair.





There is a tendency for hair beauty level to decrease with age, but there is a wide distribution in the 20s - 50s range enclosed in the dotted line.





Fig. 3 Relationship Between Hair beauty level of Women in Their 50s and Number of Visits to Beauty Salons Made Per Year

The level 6 - 8 cluster shows a trend to visit beauty salons more frequently than the level 5 or lower cluster.

For inquiries relating to this press release

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