

Mandom Establishes a Sensory Evaluation Method for a Cooling Sensation: Research and Application of a “Pleasant and Cooling Sensation” that Humans Sense -Not Simply “Cool” or “Refreshing”-

Mandom Corporation (Head Office: Osaka, President Executive Officer: Motonobu Nishimura, hereafter “Mandom”) has been researching various factors that “make people feel pleasant”, as we place as much importance on the impressions received when using our cosmetics (quasi-pharmaceutical products) as on their function. As a part of this research, we established our own technology to appropriately evaluate the “cooling sensation” induced by the use of our products. Mandom defines this “cooling sensation” as a pleasant feeling that is aroused by the simultaneous sensations of “coldness” and “exhilaration”. However, if the balance of the cooling substances and other ingredients is not correct, it may lead to the sensations of pain or burning, among other discomfort. Thus, an appropriate evaluation method for this “cooling sensation” will assist the development of products that provide an even greater pleasant cooling sensation.

The results of this research will be presented at “The 60th Society of Cosmetic Chemists of Japan (SCCJ) Workshop” held today at the Osaka International House.

1. Research background: A fine line between a cooling sensation and discomfort

Owing to the continuous occurrence of heat waves in recent years and the growing awareness of cleanliness among men, the use of deodorants by men has followed an increasing trend each year, especially young adults. With regard to the functions that are expected from deodorants, it has been revealed that the expectation of a cooling sensation was particularly high, and a trend that was characteristic in men was the demand for a continuous cooling sensation (2005, a survey by Mandom). However, contrary to the demand for a strong cooling sensation, it is not easy to provide a continuous, pleasant cooling sensation and it has been known that this can potentially lead to discomfort, such as burning or irritation. In contrast, for the evaluation of the cooling sensation, although the differences were identifiable by qualitative evaluations through sensory evaluation, the procedure is hardly accurate, as individual susceptibility varies. Furthermore, the quantitative and accurate performance of the sensory evaluation is challenging.

Hence, Mandom has been developing research methods for the accurate evaluation of the cooling sensation, as well as a formula that will not lead to pain or any other discomfort.

2. Evaluation method for the cooling sensation: The area below the ears (neck) is the most suitable location for sensory evaluation

Previously, the arms and armpits have been used to evaluate the cooling sensation. Although this method resembled the conditions of actual use, considerable variation is seen between body parts and individuals, so an accurate evaluation is hardly possible.

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Hence, in the pursuit of a more accurate method to evaluate the cooling sensation, we conducted an evaluation of 36 male subjects after the application of lotion samples that contained ℓ -menthol (a typical cooling substance) to the arms, cheeks, armpits, and the area below the ears of the subjects (refer to Figure 1). As the inner arms and armpits are less sensitive, the differences between the cooling sensation derived from the different mixtures of ℓ -menthol could not be identified. Although the cheeks are considered to be highly sensitive, the differences between the samples still could not be identified. We therefore deemed the cheeks to be inappropriate for the evaluation as the effects of shaving and stimulus from the eyes were considered influential. On the other hand, the area below the ears (neck) could identify the differences between the two samples with different amounts of ℓ -menthol. For these reasons, we concluded that the area below the ears (neck) was the most appropriate part of the body to provide an accurate evaluation (refer to Figure 2). We believe this is because the area below the ears (neck) is close to the face, which is highly sensitive to the cooling sensation, and is a sensitive body part.



Figure 1: Conducting the cooling sensation assessment

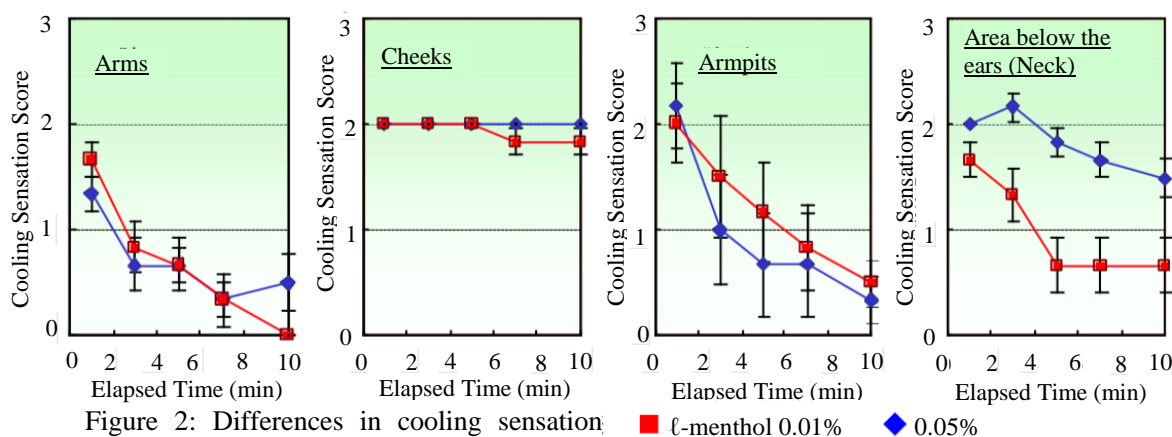


Figure 2: Differences in cooling sensation scores by body part

3. Product Evaluation: The range for a “pleasant cooling sensation” is very narrow! A strong sense of coldness is not sufficient

More than 30% of all of the subjects experienced discomfort, such as pain or a burning feeling, from the lotion sample that contained 0.5% ℓ -menthol. However, less than 5% of the subjects experienced discomfort from the lotion sample that contained 0.3% ℓ -menthol. The lotion samples containing 0.5% ℓ -menthol scored between 3 and 4 on the cooling sensation scale, whereas the lotion samples containing 0.3% ℓ -menthol scored approximately 3 or below (Figure 3). From these results, we found that although an adequate amount of cooling sensation can be pleasant, a cooling sensation score of above 3 was too strong and could lead to discomfort. From this finding, we defined the “comfort zone” as a score between 1 and 3 in the cooling sensation evaluation method we established.

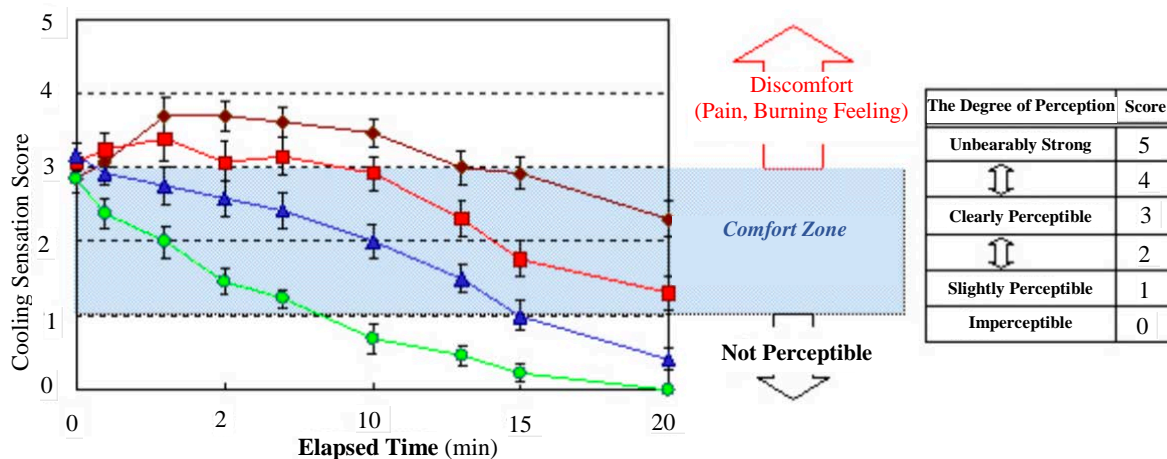


Figure 3: Intensity of cooling sensation and endurance among lotion samples

● l-menthol 0.1% ▲ 0.3% ■ 0.5% ◆ 0.9%

However, it is difficult to control the cooling sensation only by the composition of cooling substances. Therefore, controlling the technology of the cooling sensation formed by studying the formulation of not only cooling ingredients, but also other ingredients, is essential.

By continuing our research based on these results, we were able to develop the GATSBY Ice Deodorant Spray which is able to sustain the “comfort zone” score for a prolonged period of time (Figure 4).

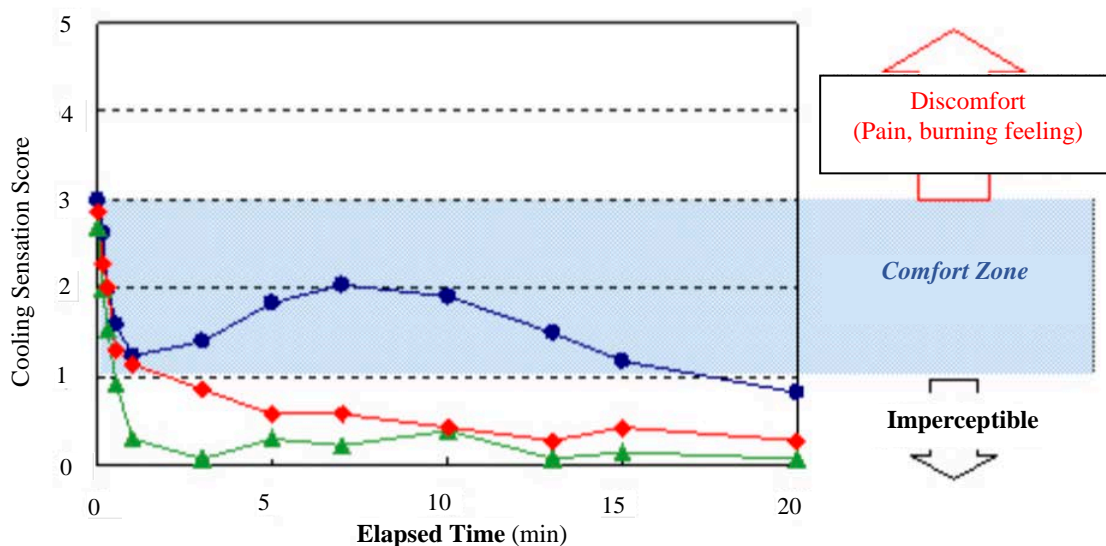


Figure 4: Intensity of cooling sensation and endurance of the GATSBY Ice Deodorant Spray

● GATSBY Ice Deodorant Spray ▲ Deodorant Spray A
 ◆ Deodorant Spray B

Mandom will continue to research further products after the newly developed GATSBY Ice Deodorant Spray, and will be releasing more products to the market that can sustain the pleasant cooling sensation for a long time without any discomfort, such as pain or a burning feeling.