

Research by Mandom and application of “comfortable coolness”: Effect of perspiration on cooling sensation

-Achieving a better and more comfortable cooling sensation-

Mandom Corporation (Head Office: Osaka, President Executive Officer: Motonobu Nishimura, hereafter “Mandom”) has been studying the “various factors in sensing comfort” in people, while emphasizing both, the usability and function of cosmetics (quasi-drugs). As part of this, we previously established a method for accurate quantitative evaluation of cooling sensations in subjects sensitive to cooling sensations in their 20s and 30s. Here, we discuss further evaluations performed under real-life conditions, and have discovered that the range of comfortable cooling sensations differs depending upon the perspiration state of the individual. These results have been presented at the “9th Congress of Asian Societies of Cosmetic Scientists (ASCS) (Pacifico Yokohama)” held from March 2-4.

[Summary findings – Research on “comfortable coolness”]

- ① Established sensory evaluation method for cooling sensations, and defined the range of comfortable cooling sensations (Released June 14, 2007)
- ② Discovered no gender differences in sensitivity to cooling sensations, and that the comfort range differed depending upon gender and the characteristics of skin (Released July 11, 2008)
- ③ Discovered a range of comfortable cooling sensations not only at normal times but when perspiring (in the present communiqué)

1. Focus on two freshening ingredients

In the recent years, increasing consciousness of cleanliness in male consumers has led to greater use of deodorants. Furthermore, many refreshing cosmetics are now available, including cleansers and lotions claiming to be “refreshing” and “cool.” These refreshing cosmetics contain two types of freshening ingredients, *l*-menthol, and *l*-menthyl glyceryl ether (hereinafter, MGE). We focused on these two types of freshening ingredients, and evaluated their differences in their ability to produce cooling sensation.

2. Strong cooling sensation felt when perspiring

In general, cosmetics that provide a cooling sensation are considered to be used for reducing unpleasant feelings, such as the physical sensation of burning after perspiring from playing sports or the summer heat. Refreshing cosmetics are therefore, used in a wide variety of situations. Replicating such conditions for studying makes evaluations difficult.

Therefore, to develop products that feel comfortable irrespective of the conditions in which they are used, we considered the idea that cooling sensations when perspiring might differ in sensitivity than from cooling sensations at normal times. So, we first used subjects with high

Table 1. Cooling sensation score

Indices of degree	Score
Intolerable	5
⇕	4
Clearly felt	3
⇕	2
Faint	1
No irritation	0

Contact

mandom corp.
 Public Relations Div.
 mail: press@mandom.co.jp
 Please contact us in Japanese or English.

URL: <https://www.mandom.co.jp/en/>



sensitivity to cooling sensations, and evaluated the differences in cooling sensation when perspiring after using model refreshing cosmetics (Table 1). Based on the results, as shown in Fig. 1, after using ℓ -menthol-containing model refreshing cosmetics, there was no change in the level of the cooling sensation before and after perspiring. However, when MGE-containing model refreshing cosmetics were used, the intensity of cooling sensation increased significantly after perspiring. In addition, it was found that when model refreshing cosmetics were used after perspiring, MGE cosmetics were found to be weaker than ℓ -menthol cosmetics in their ability to produce a cooling sensation. However, they were able to maintain the cooling sensation for longer periods of time (Fig. 2).

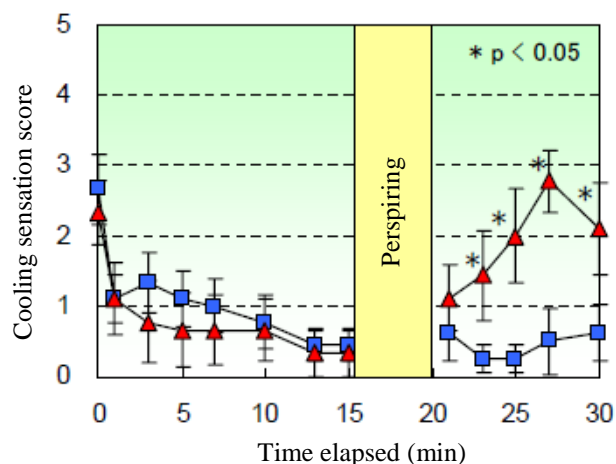


Fig. 1. Changes in cooling sensation when perspiring after use of model refreshing cosmetics
 ■: ℓ -menthol, ▲: MGE

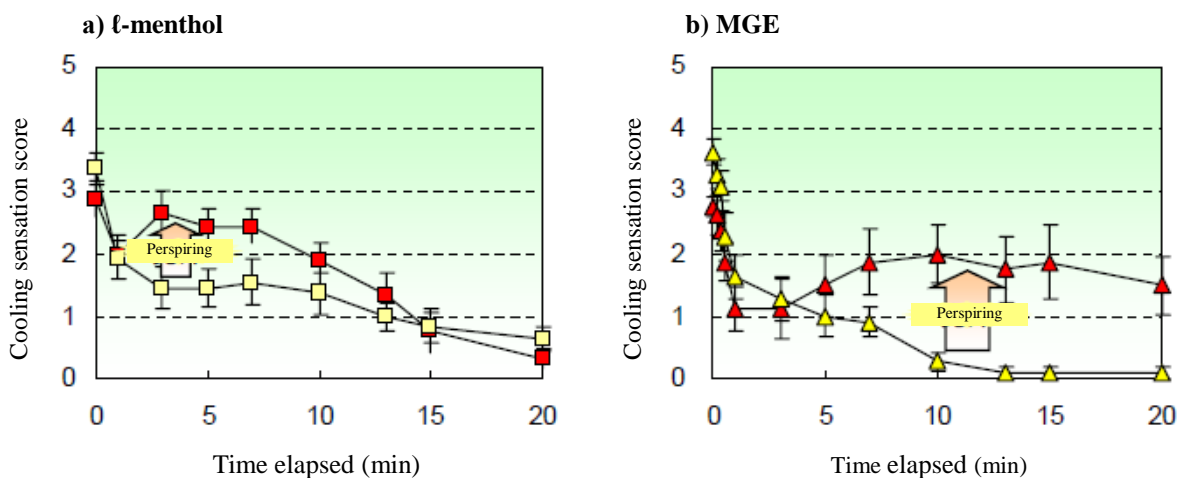


Fig. 2. Changes in cooling sensation when using model refreshing cosmetics after perspiring
 a) ℓ -menthol ■: perspiring, ■: normal, b) MGE ▲: perspiring, ▲: normal

3. Magnitude of comfortable cooling sensation differs between normal times and during perspiration

From the results of the above evaluation, it was found that cooling sensation was more strongly felt when perspiring than at normal times. This suggests that when products that feel comfortable at normal times are used when perspiring, the cooling sensation may become too strong and feel uncomfortable. Therefore, we evaluated the comfort of cooling sensations when perspiring and at normal times in regular subjects using model refreshing lotions.

Based on the results, as shown in Fig. 3, the comfort level for the model refreshing lotions felt with a 0.9% mixture of ℓ -menthol was uncomfortably strong for 58% of all subjects at normal times. The number of people who experienced discomfort decreased to 28% when perspiring. On the other hand, with model refreshing lotions with a 0.3% mixture of ℓ -menthol, 35% of people experienced discomfort at normal times, which dropped to 14% when perspiring.

In addition, as shown in Fig. 4, and based on the results of evaluating satisfaction with the intensity of the cooling sensation with model refreshing lotions containing a 0.9% mix of ℓ -menthol, we found that 42% of all subjects experienced dissatisfaction at normal times. The number of people feeling dissatisfied decreased to 28% when perspiring. This suggests that cooling sensations of an intensity feeling uncomfortably strong at normal times may decrease in unpleasantness during perspiration, and may increase satisfaction. Therefore, a stronger cooling sensation is preferred when perspiring.

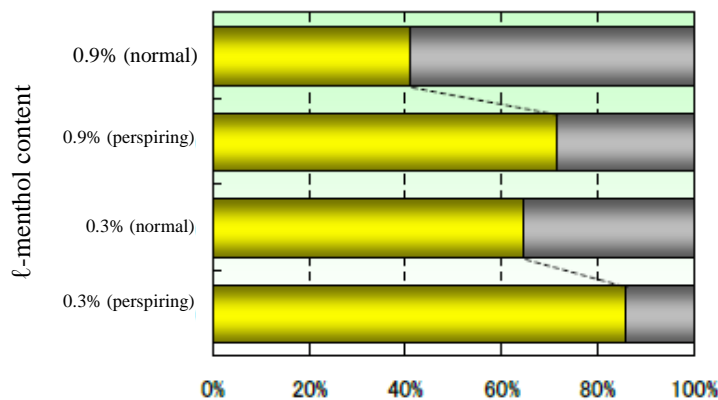


Fig. 3. Comfort level of model refreshing lotion
■ : Comfort ■ : Discomfort

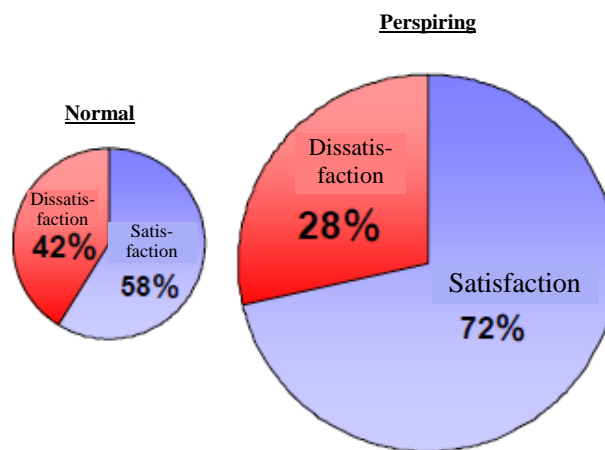


Fig. 4. Satisfaction level with the intensity of cooling sensation using a 0.9% menthol-containing model refreshing lotion

Thus, from the level of comfort and satisfaction of cooling sensations at normal times and when perspiring, we used the cooling sensation evaluation method established previously to define the range between the cooling sensation score from 2 to 4 as a “comfort zone” of cooling sensation when perspiring. We confirmed that the comfort zone with cooling sensation scores of 1 to 3 at normal times rose by a point when perspiring (Fig. 6).

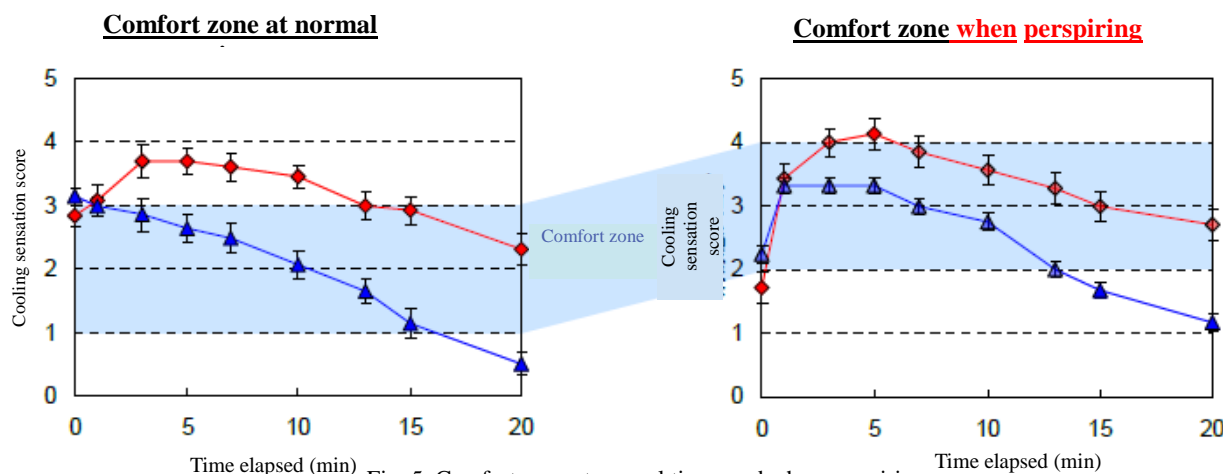


Fig. 5. Comfort zone at normal times and when perspiring

◆ : 0.9% ℓ -menthol ▲ : 0.3%

From these results, it is clear that perception of cooling sensation differs depending upon the presence of perspiration with the same products, and when perspiring, it is possible that discomfort may be experienced with products that feel comfortable at normal times. Based on these findings, it is possible to develop cosmetics that may be comfortably used without any unpleasant sensations such as pain or burning, whatever the conditions may be, by evaluating them under real-life conditions instead of one set of conditions.

At Mandom, we intend to continue this research and develop products that feel even more comfortably cool.

END