







Development of terms to measure consumer emotions associated with milk coffee and evaluation of flavor characteristics and emotions associated with chilled milk coffee beverages

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Introduction

Milk coffee can be enjoyed by adjusting the amounts of milk, coffee, and sugar to suit individual preferences. The flavor characteristics vary significantly depending on the quantities of these three components, as does likely the emotional response evoked upon consumption.

This study aimed to develop a list of terms for measuring consumer emotions associated with milk coffee, evaluate emotions related to various chilled milk coffee beverages sold in Japan, and explore the relationship between these emotions and flavor characteristics.

Conclusion/Perspectives

- We developed a list of emotional evaluation terms for milk coffee by screening terms using EsSense Profile® and additional terms through term collection.
- Emotional evaluations of milk coffee using the new terms revealed correlations with flavor characteristics. This study visualized the differences in emotions evoked by various milk coffee flavors.
 The findings suggest the potential to recommend different milk coffee flavors based on consumers' emotions and circumstances.

Materials/Methods

Samples:

Six types of chilled milk coffee beverages (Mt. RAINIER brand) sold in Japan by Morinaga Milk Industry (Tokyo, Japan).



Figure 1. Composition of samples (Milk solid, Coffee, and Sugar)

Sensory evaluation:

Conducted using a quantitative descriptive analysis (QDA) [1] panel (14 females) for milk coffee.

Emotion evaluation:

Performed with 65 or 66 consumers using the "check-all-that-apply" (CATA) method with 39 EsSense Profile® terms [2] or terms optimized for milk coffee.

Development of new terms for milk coffee:

- In the emotion evaluation using 39 EsSense Profile® terms, terms with a selection rate <10% and no significant difference (p > 0.05) among the six samples were excluded (first quantitative screening [QS]).
- 2) An online survey of 200 consumers was conducted to collect appropriate positive Japanese terms for "Non-Sugar" and "Non-Sweet". Terms described by ≥10% of 97 fans of these beverages were consolidated as synonyms and newly added.
- 3) In the emotion evaluation using the optimized terms, a second QS was performed.

Results/Discussion1

First QS and collecting terms for "Non-sugar" and "Non-sweet"

- √ As a result of first QS, four words were deleted.
- The selection rate of positive terms was low for "Non-sugar" and "Non-sweet" (data not shown).
 Therefore, we collected and added positive emotional evaluation terms for "Non-sugar" and "Non-sweet".

Table 1. List of 39 EsSense Profile® and added terms

Polite	Nostalgic	Loving
Friendly	Understanding	Merry
Worried	Aggressive	Warm
Pleasant	Free	Whole
Bored	Interested	Eager
Pleased	Joyful	Guilty
Disgusted	Glad	Healing
Adventurous	Tender	Transforming
Energetic	Good	Invigorating
Active	Enthusiastic	Refreshing
Wild	Steady	
	Friendly Worried Pleasant Bored Pleased Disgusted Adventurous Energetic Active	Friendly Understanding Worried Aggressive Pleasant Free Bored Interested Pleased Joyful Disgusted Glad Adventurous Tender Energetic Good Active Enthusiastic

Among the 39 EsSense Profile®terms, four were deleted (shown in brown font) and four were added (shown in green font).

* "Interested" was deleted during the second QS.

Results/Discussion2

Second QS and QDA

- As a result of screening, the word "interested" was deleted, and finally 38 emotion terms for milk coffee were established.
- √ Correspondence analysis of the CATA data (Figure 2) and principal component analysis of the QDA data (Figure 3) showed similar discriminations among the six samples and high similarity (RV coefficient [3] = 0.876, p= 0.008) between the analyses.

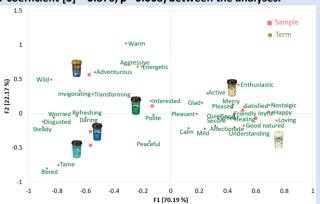


Figure 2. Correspondence analysis of the CATA

 \checkmark Six products were identified by emotional evaluation and QDA.

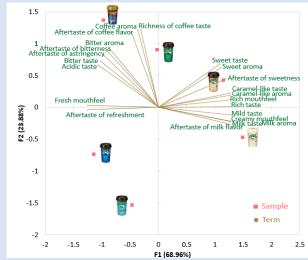


Figure 3. Principal component analysis of the QDA

References:

[1] Hatakeyama et al. 2023, Food Science and Technology Research, 29(3), 197-209 [2] King and Meiselman 2010 Food Quality and Preference 21(2), 168–177 [3] Robert, P. & Escoufier, Y. Journal of the Royal Statistical Society. Series C (Applied Statistics). 25, 257–265 (1976).