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A Study to Recruit and Train the Product oriented Sensory Panel

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ABSTRACT

Food industry greatly depends on product quality and price. Sensory evaluation is a scientific method that humans evaluate the eating quality parameters of food. The study was conducted to evaluate the performances of the existing sensory panel, to recruit and train new members to sensory panel and to evaluate the performance of the product oriented sensory panel in the Industrial Technology Institute. Recruitment and training of product-oriented sensory panel was done according to the International Standards 8586-1:1993. Initially 29 interested staff members, who were in good health, were selected through a questionnaire from the same institute. Then they were subjected to several screening tests, namely basic taste identification test, odour descriptive test, ranking test for the taste intensity, ranking test for the colour intensity, matching test and texture descriptive test. Seventeen people who were selected from all screening tests were trained in detection and recognition of tastes and odours, followed by discrimination tests (Paired comparison test, Duo-trio test and Triangle test) and three different scales (Category scale, Interval scale and Ratio scale). Results of the sensory evaluations and scales were statistically analyzed via Friedman Two Way ANOVA rank sum test with SAS 9.0 software. The samples tested were significantly different from each other ($p<0.05$) in each test and no significant difference occurred between the judgment of the panelists. It concluded that they performed as a homogenous trained panel. Finally, sensory evaluation of black tea was conducted which was shelf life evaluation to evaluate the performance of the panelists with a real test samples. Data were analyzed via Friedman test and results revealed that all the panelists performed uniquely at 0.05 significance level. Therefore the recruited sensory panel was considered as a trained sensory panel and the outcome proved that the effectiveness of training and capability of chosen the product-oriented sensory panel.

KYWORDS: *Sensory evaluation, Recruitment, Standard, Quality, Intensity*

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1. INTRODUCTION

World food market greatly depends on the product quality and price. Sensory or organoleptic properties play an important role in food quality concerns. Therefore, continuous improvement and maintenance of product quality are very much important to achieve more profit in the food industry and to ensure the consumer satisfaction as well as their health. Sensory analysis is a method that can evaluate the food products quality and human responses to food products. Sensory evaluation is a scientific method which uses human panelists and their senses of sight, smell, taste, touch, and hearing to measure the sensory characteristics and acceptability of food products as well as many other materials. Due to these reasons sensory analysis used in many areas such as shelf life studies, new product development, improvements of products, quality control, product acceptability studies and supporting for advertising claim. Sensory evaluation consists of various test methods and statistical procedures that provide guideline for analysis and interpretation of results. Three sensory tests are commonly used which are descriptive test, difference test and preference test. Descriptive tests are used to describe the perceived sensory characters of food and they are more appropriate in the product development context. Difference tests measure overall differences among products and how they would describe the differences. Preference tests measure consumer likes and dislikes of products. Sensory evaluation panels can be grouped into the three types as highly trained expert panel, laboratory panel and large consumer panels. Highly trained and experts and laboratory panels evaluate the quality especially during development stages and large consumer panel are used to determine consumer reaction to a product. Industrial technology institute supports food industry by developing new food products and improving products developed by the industry. Therefore, the sensory panel should be screened and trained according to standard methods. Performance of the existing sensory panel should be evaluated periodically, and they should be re-trained to maintain valid assessments. Therefore objectives of the research were **t**o evaluate the performance of existing sensory panel, to recruit and train new members to the sensory panel, to evaluate the performance of the trained panel.

2. METHODS

The basic selection for the sensory panel was done through the questionnaires based on the candidates' age, health condition, availability, interest and motivation. Selected candidates were exposed to several screening tests according to the ISO standards. The Basic Taste Identification Test was conducted using four basic tastes (sweet, sour, bitter and salt) were prepared using food grade reference substances and were presented randomly to each assessor and they were asked to identify the taste of the samples. Persons, who were able to identify 100% of the samples, were selected for the next screening test. The odour descriptive test was done using six olfactory stimuli related to food products. Samples of reference substances were presented randomly to each assessor, for the identification of odours and assessors who were able to identify more than 65% of the samples were selected for the next screening tests. The ranking test for taste intensity was carried out using sucrose solutions of 5%, 7%, 10% and 12.5% (w/v) concentrations were prepared and presented to the each assessor and assessors who correctly

arranged the samples in the order of increasing intensity were selected for the next screening test. The Ranking Test for colour intensity was done with prepared colour ranges of blackcurrant squash concentrate and presented to the assessors to arrange the samples in order to increasing colour intensity correctly, and they were selected for the next screening test. The Matching Test was conducted using four different tastes at given concentrations and four olfactory stimuli at given quantities were prepared using reference substances and presented to the panelists and asked to match the sample with the original once with their memory and describe the taste or odour of each sample. The Texture Descriptive Test was conducted using a series of food products that were given to the assessors and asked to describe the textural characteristics of samples. Assessors who were able to describe more than 65% of the samples correctly were selected for the panel. The selected assessors were trained for the Difference Tests (i.e. Paired Comparison Test, Duo-trio test and Triangle Test) and scales (category scale, interval scale and ratio scale). Finally, the panel performances were evaluated through the sensory evaluation of commercial black tea.

3.RESULTS AND DISCUSSION

Initially questionnaires were distributed among members of ITI and among 30 candidates who submitted the filled questionnaires; those people who were poor health conditions and were taking medication for long time which might affect their senses and have food allergies were not recruited. Finally 29 panelists were selected. 19 out of 29 were able to identify the tastes of all the samples correctly in the basic taste identification test. A total Participants 17 able to describe the odours of more than 65% of the samples correctly in the odour descriptive test. Some people found difficulties in describing certain odours, even though they felt that they were familiar with these odours. In the ranking test for taste intensity and colour intensity, all the assessors were able to arrange all the samples in order of increasing intensity of sweet taste and intensity of colour respectively. In the matching test all the assessors were able to recall their memory and described the tastes and odours of more than 65% of the samples correctly. In the texture descriptive test all the panelists were able to describe the texture of the all samples correctly. Therefore, they were selected as the panelist for the sensory panel. The selected panel was trained in the detection and recognition of tastes and odours of paired comparison test for both taste and odours. The obtained results were statistically analyzed at 0.05 significance level using a table given for the binomial distribution tests ISO 5495- 1983 (E). All the panelists were able to detect significant difference in taste between two sucrose solutions and odour difference between two coconut oil samples. The results obtained from duo-trio test for both taste and odours were statistically analyzed and there was a detectable difference between artificial vinegar and natural coconut vinegar and panelists had correctly identified this difference. The results obtained from triangle test were statistically analyzed and it was revealed that panelists were capable of detecting the taste difference between these two types of milk. The training in the use of scales, the results obtained from category scale numerical values were statistically analyzed using non-parametric Friedman two way ANOVA test. The probability value for the samples was 0.0001 and it was less than 0.05 significant level. Therefore there was a significant difference

between samples and probability value for judges was 0.1383 and it was larger than 0.05 significant level. Therefore there is no significant difference between the judgments of the panelists. The results obtained from interval scale, the probability value for the samples is 0.0001 and it is less than 0.05 probabilities. Therefore, there is a significant difference between samples and the probability value for judges is 0.2730 and it is larger than 0.05 probabilities. Therefore there is no significant difference between the judges' results. The results obtained from ratio scale, the probability value for the samples is 0.0001and it is less than 0.05 probabilities. Therefore, there is a significant difference between samples and the probability value for judges is 0.4787 and it is larger than 0.05 probabilities. Therefore, there is no significant difference between the judges. Finally the evaluation of panel performances was carried out using a commercial product of black tea. According to the output of the non-parametric Friedman test, the probability value for the judges is 0.3477 and there is no significant difference between the evaluations of judges at 0.05 significance level. That means judges were performed uniquely. Therefore we can consider them as a homogeneous trained sensory panel.

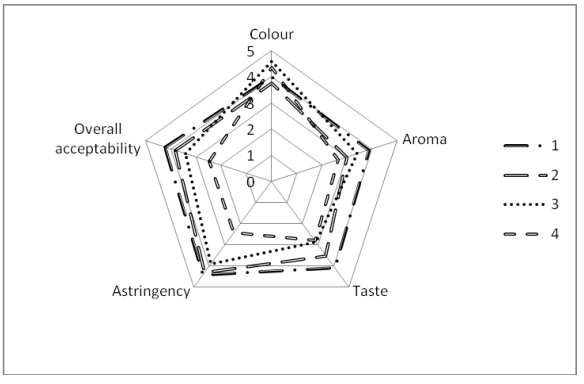

Figure1. Results of sensory evaluation of black tea

According to the output of the non-parametric Friedman test, aroma, taste, astringency, overall acceptability of the four tea samples tested were significantly different ($p<0.05$). There is no significant difference between colour of the four samples.

4. CONCLUSION

Performance of the existing panel complies with the requirements of ISO 3972:1972. Twelve new members were recruited to the product oriented sensory panel. The performance of the panelists was not significantly different in sensory evaluation of black tea. This panel can be considered as a homogenous trained panel and this product-oriented sensory panel can be used for scientific assessment of the food products.

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