RESEARCH ARTICLE

A SENSORY ANALYSIS OF SUGARCANE (CO86032) BLENDED BEVERAGES

Abstract:

Objective: The present study was intended to develop sugarcane blended beverages with fruits (Watermelon, pineapple, orange, apple), vegetables (Beetroot and carrot) and assess the acceptability through sensory evaluation.

Methods: The sugarcane variety was obtained from the Rudrur, Regional Sugarcane and Rice Research Station in Nizamabad. The variety that gathered was Co86032. Sugarcane variety(Co86032)was combined with watermelon, pineapple, orange, apple juices and vegetable juices like beetroot and carrot to create blended beverages for the control group (SCO) and experimental groups at varying ratios of 100, 50:50, 60:40, 70:30 and 80:20.

Results: Among all the combinations SCWA2 (Sugarcane-60:Watermelon-40), SCPA3 (Sugarcane-70:Pineapple-30), SCOA3 (Sugarcane-70:Orange-30), SCAP4 (Sugarcane-80:Apple-20), SCBT4 (Sugarcane-80:Beetroot-20) and SCCA4 (Sugarcane-80:Carrot-20) had best acceptability when compared to both the control and experimental samples across all sensory measurements.

Keywords: Co86032sugarcane variety,sugarcane blended beverages, sensory evaluation.

Introduction: Sugarcane, scientifically known as *Saccharum officinarum*, is extensively grown as a significant crop in tropical and subtropical areas across the globe. India ranks as the second largest sugarcane producer globally, with a cultivated area of 5.06 million hectares and an annual crop yield of 366.8 million tons. Sugarcane juice is a prevalent beverage in regions where sugarcane is cultivated for commercial purposes (Agarkar and Aggarwal, 2019). The sugarcane juice is a refreshing *saccharine* soft drink that can be found throughout India. It is a crucial commodity on the global market due to its extensive health advantages. In a market driven by health-conscious consumers, sugarcane juice competes with other soft beverages to the economic benefit of sugarcane farmers Kaavya *et al.* (2019). It was usual practise to use sugarcane juice as a treatment for jaundice. Additionally, sugarcane juice is a significant source of treatment and prevention for sore throats, the common cold and influenza. Because it has a low glycaemic index diabetics don't need to worry about the negative effects of drinking this sweet beverage on their health. According to Subbannanyya*et al.* (2007) it assists in rapidly hydrating the body in situations in which it has been subjected for an extended period of time to heat and physical exertion.In Ayurvedic medicine both the roots and stems of sugarcane are used to treat a variety of diseases (Kadam *et al*., 2008).According to Karthikeyan and Samipillai (2010) it was also essential to find a treatment for health conditions such as high acidity, gonorrhoea, an enlarged prostate and cystitis.Thus, combining various fruit and vegetable juices to make sugarcane juice beverages

is considered a practical and cost-effective option for using different fruits. Despite the high market demand for sugarcane juice its safety processes and storage life pose significant challenges resulting in limited availability in packaged form. Significant endeavours have been dedicated to developing a nutritious beverage that can be widely marketed (Agarkar and Aggarwal, 2019). Sugarcane juice, also known as the drink of the common man is extensively consumed in Southeast Asia, South Asia and Latin America as a refreshing energy drink. Sugarcane juice competes with other soft beverages on the market where health-conscious consumers exert pressure to the financial benefit of sugarcane farmers. Sugarcane juice contains natural sugars, minerals including iron, magnesium, phosphorus, calcium and organicacids including malic acid, succinic acid, acotinic acid, amino acid, protein, glucose, gums, waxes and non-sugar phosphatides(Rimal *et al.*, 2022).The results of the sensory evaluation of the beverage indicated that the fermentation of G. *lucidum* could preserve the sensory quality of sugarcane juice. The fact that the nutrients and functional components in the 5 °Brix fermentation beverage were significantly higher than those in sugarcane juice suggested that the G.*lucidum* fermentation could enhance the nutritional value of sugarcane juice. In addition, it was discovered for the first time that the fermented beverage samples exhibited considerable antioxidant activity without cytotoxicity (Wang *et al.*, 2022).The sugarcane juice has a high sugar content that degrades rapidly following the extraction procedure. The addition of S. *platensis* water extract to sugarcane juice decreases the sample's pH thereby enhancing the stability of sugarcane juice. In was concluded that the addition of S. *platensis* water extract to sugarcane beverage enhances consumer acceptance. The water extract could also serve as a colouring agent in sugarcane juice without altering the juice's physicochemical or sensory properties (Zaidan *et al.*, 2021).Juice was extracted using a sugarcane juice extractor and lemon juice was added to maintain a pH between 4.2 and 4.3. The results indicated that a beverage of high quality could be made from sugarcane juice with a satisfactory storage stability of 21 days at room temperature and 56 days when refrigerated if the juice was microwaved for three minutes(Pradhan *etal.*, 2020).

Materials and methods:The present study was conducted at the Post Graduate and Research Center within the department of Foods and Nutrition at Professor Jayashankar Telangana State Agriculture University which is located in Rajendranagar, Hyderabad, India.

Procurement of raw materials: The sugarcane variety chosen for this study was Co86032. This cultivator was obtained from the Regional Sugarcane and Rice Research Station located in Rudrur, Nizamabad. The aforementioned cultivator was gathered and the process of

extracting juice was carried out. Additionally, the necessary raw materials for preparation were obtained from the local market in Hyderabad.

Preparation of sugarcane blended beverages: Various fruits such as watermelon, pineapple, orange, apple as well as vegetables like beetroot and carrot were obtained from the local market. The fruits and vegetables were subjected to a series of steps including sorting, grading, washing in clean tap water, draining to eliminate surplus water and ultimately surface drying. The fruits and vegetables were halved using stainless steel blades on a preparation table (SS) and the juice was extracted using a manually operated equipment (Manual fruit squeezer). The juice was then filtered through four layers of muslin cloth to remove any coarse fibrous material. Ultimately, the juice was transferred into PET bottles and securely sealed with sterile lids. Subsequently they were progressively cooled to the ambient temperature by running tap water left to dry on the surface and ultimately branded. The bottles were stored under refrigerated conditions for future use in beverage preparation.

Table 1 : Standardization of sugarcane juice blended with other juice Formulations

Product	T0 (Sugarcane juice)	T1	T2	T3	T4
Sugarcane and watermelon (SCWA)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**
Sugarcane and pineapple (SCPA)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**
Sugarcane and orange (SCOA)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**
Sugarcane and Apple (SCAP)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**
Sugarcane and beetroot (SCBT)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**
Sugarcane and carrot (SCCA)	**100:0**	**50:50**	**60:40**	**70:30**	**80:20**

Note: All the formulas were iterated three times.

The quantities of all the ingredients were measured in grams.

SCWA- Sugarcane and watermelon

SCPA- Sugarcane and pineapple

SCOA- Sugarcane and orange

SCAP- Sugarcane and Apple

SCBT- Sugarcane and beetroot

SCCA- Sugarcane and carrot

Finalization of sugarcane blended with other fruit juices and vegetable juices: Along with control the other samples of sugarcane juice (CO86032-SCO) blended with other fruit and vegetable juices were subjected to sensory evaluation and depending on the sensorial scores the best accepted samples of sugarcane blended beverages were evaluated.

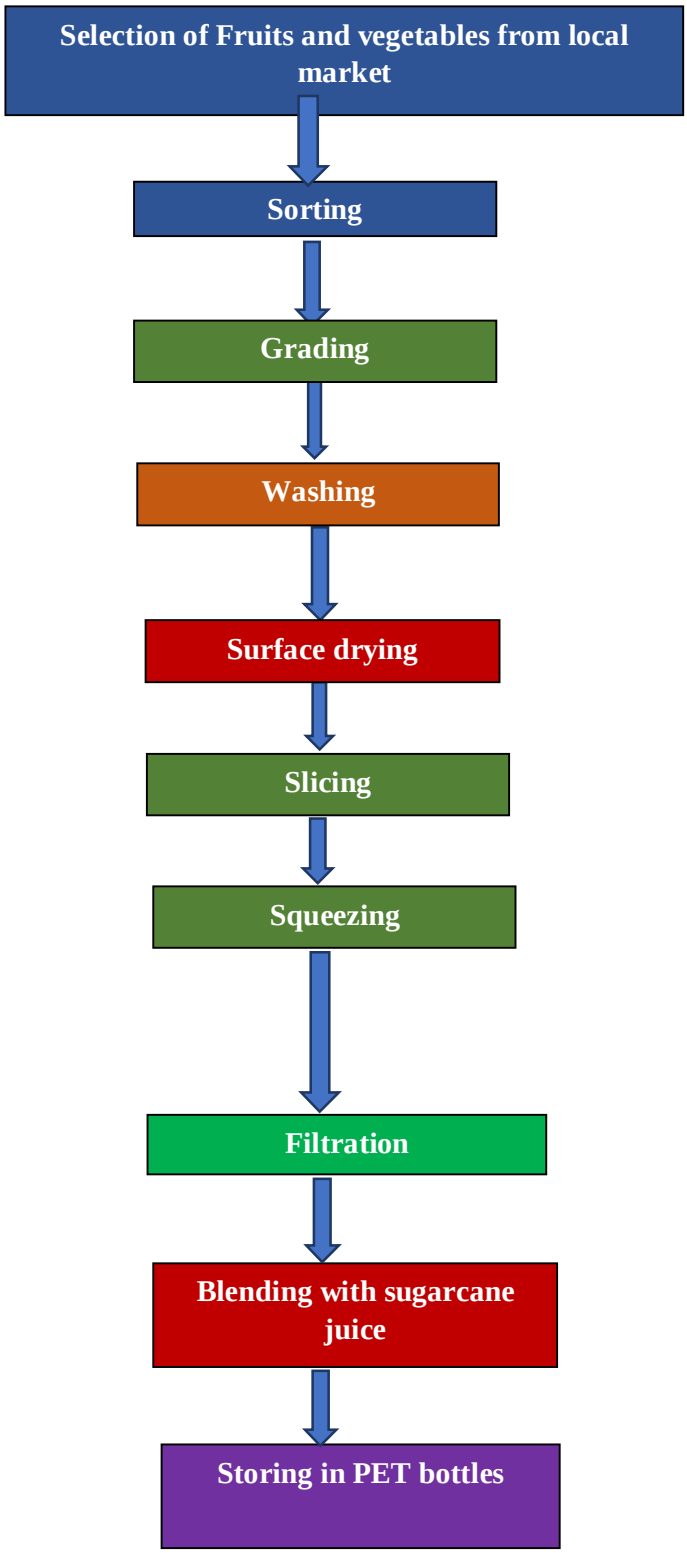

Figure 1**Unit operations for the preparation of sugarcane blended beverages**

Sensory evaluation:A group of 20 semi trained individuals from PGRC, PJTSAU assessed the sugarcane blended beverages for their apperance, colour, aroma, taste, after taste, consistency and overall acceptability using a 9-point hedonic scale. The scores were determined using a hedonic scale ranging from 1 to 9, where 1 represents severe dislike (very bad) and 9 represents extreme liking (great). Panelists rinsed their mouths with water following the evaluation of each sample(Meilgaard *et al.*, 1999).

Statistical analysis of data: The statistical analysis of the results utilized percentages, mean, standard deviations (Snedecor and Cochran, 1983) to ascertain their significance. The analysis was performed in many replications and the results were reported as the mean value ± standard deviation. The statistical significance of the disparity between the variables was assessed using SAS version 9.1 using an analysis of variance (ANOVA).

Results and discussion:

Sensory acceptability of sugarcane variety(Co86032)blended watermelon beverages: The mean sensory rating for the sugarcane variety (Co86032-SCO) combined with watermelon can be seen in Figure 2. Out of the five samples the experimental sample SCWA2 received the highest average sensory score for colour with a value of 7.97±0.04. This was followed by SCO and SCWA4 which both of them received a same score of 7.00±0.00. The experimental sample SCWA3 received a slightly lower score of 6.98±0.04 and SCWA1 had the lowest score of 6.96±0.04. The sensory evaluations for appearance were ranked in descending order as follows: 7.99±0.02 for SCWA2, 7.00±0.00 for SCO, SCWA1 and SCWA3 and 6.99±0.02 for SCWA4.

The mean sensory score for the control sample in relation to aroma was 7.00±0.00. Out of the four remaining samples, the experimental sample SCWA1 had the lowest score of 6.00±0.00, while SCWA2, SCWA3, and SCWA4 all had the same mean sensory score of 7.00±0.00. The mean sensory evaluations for taste were as follows: SCO (7.00±0.00), SCWA1 (7.00±0.00), SCWA2 (8.00±0.00), SCWA3 (7.00±0.00) and SCWA4 (6.99±0.02). The taste measure achieved its highest average sensory score in experimental sample SCWA2 of the sugarcane blended beverages. The sensory evaluations for after taste were ranked in ascending order as follows: 6.00±0.00 for SCWA1 and SCWA4, 7.00±0.00 for SCO and SCWA3 and 8.00±0.00 for SCWA2.

The mean sensory evaluations for consistency were highest in experimental sample SCWA2 and control sample-SCO (7.00±0.00) whereasthe lowest mean sensory score was seen in SCWA1 and SCWA4 (6.00±0.00) while the consistency value for SCWA3 was 6.92±0.04. The average sensory scores for overall acceptability were as follows: SCWA2 scored 8.00±0.00, SCO and SCWA3 scored 7.00±0.00, SCWA1 and SCWA4 experimental samples scored 6.00±0.00. The findings shown in Figure 2 unambiguously demonstrated that SCWA2 had superior performance compared to both the control and other experimental samples across all sensory measurements. The difference was statistically significant with a significance level of $p \leq 0.05$.

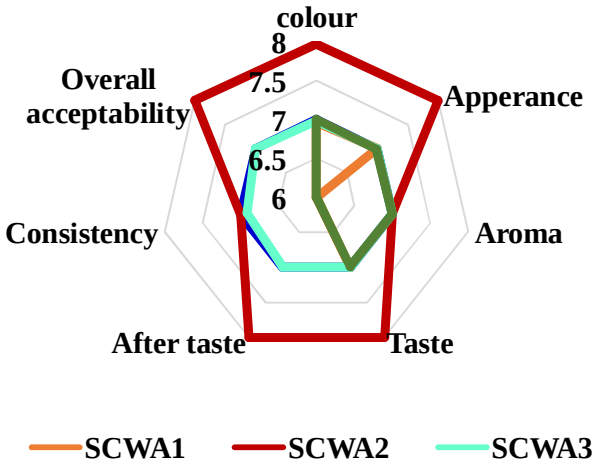

Figure 2**Mean sensory scores of sugarcane variety (Co86032)blended watermelon beverages**
Note:SCO: Co86032 sugarcane variety
SCWA1: Sugarcane juice (50): Watermelon juice (50)
SCWA2: Sugarcane juice (60): Watermelon juice (40)
SCWA3: Sugarcane juice (70): Watermelon juice (30)
SCWA4: Sugarcane juice (80): Watermelon juice (20)

Sensory evaluation of sugarcane variety(Co86032) with pineapple blended beverages: Sugarcane variety(Co86032)and pineapple were combined to create blended beverages for the control group (SCO) and experimental groups (SCPA1, SCPA2, SCPA3, SCPA4) at varying ratios of 100, 50:50, 60:40, 70:30 and 80:20. The participants underwent sensory evaluation and the resulting data was subjected to statistical analysis. The findings can be seen in Figure 3.

From Figure 3it was displayed that the average sensory scores for sugarcane cultivar (Co86032- SCO) with pineapple blended beverages. The experimental sample SCPA3 received the highest mean sensory score for colour with a score of 8.00±0.00. It was followed

by SCO, SCPA1 and SCPA2 which all of them had a same score of 7.00±0.00. The experimental sample SCPA4 received the lowest mean sensory score of 6.00±0.00.

The average sensory scores for appearance ranged from 7.00±0.00 to 8.00±0.00. Out of the five samples SCPA3 had the greatest mean sensory score of 8.00±0.00 whereas SCO, SCPA1, SCPA2 and SCPA4 had the lowest mean sensory score of 7.00±0.00 for appearance. A notable disparity was seen between the experimental samples and the control sample, with a significance level of $p \leq 0.05$. The sensory scores for the aroma for sugarcane blended beverages ranged from 8.00±0.00 (SCPA3) to 6.00±0.00 (SCPA4). The SCPA3 experimental sample had a higher aroma score compared to the control sample. The average sensory score for aroma was reported as 7.00±0.00 for SCPA1, SCPA2 and the control sample.

When comparing the experimental samples, SCPA3 (8.00±0.00) exhibited a high taste score while SCPA4 (6.00±0.00) had a lower score. The disparity among the samples was statistically significant at a significance level of $p \leq 0.05$. The average sensory ratings for taste were reported as same in both the experimental samples-SCPA1 and SCPA2(7.00±0.00). When compared to the control these samples received lower values. The average sensory score for taste for the control sample was (SCO) 8.00±0.00. The taste scores are ranked in ascending order as follows: SCPA3 < SCO < SCPA1 < SCPA2 < SCPA4.

The average sensory scores for aftertaste varied from 6.00±0.00 to 8.00±0.00. Out of the five samples the experimental sample SCPA3 had the greatest mean sensory score of 8.00±0.00 while SCO, SCPA1 and SCPA2 had a same mean sensory score of 7.00±0.00. The lowest mean sensory score for aftertaste was seen in SCPA4 which had a score of 6.00±0.00. A notable disparity was seen between the experimental samples and control sample with a statistical significance at a p-value of ≤ 0.05.

Out of all the samples SCPA1, SCPA2, SCPA3 and Control (SCO) had a same mean sensory score of (7.00±0.00) for consistency. The experimental sample SCPA4 had the lowest score of 7.30±0.48. The sample SCPA3 and SCO had the highest mean sensory score for overall acceptability (8.00±0.00) followed by SCPA1 and SCPA2 experimental samples (7.00±0.00). The SCPA4 experimental samplewas received the lowest score of 6.00±0.00.

Figure 3 unambiguously demonstrated that SCPA3 has achieved the greatest overall sensory acceptability score among the five combinations surpassing both the control and the experimental samples.

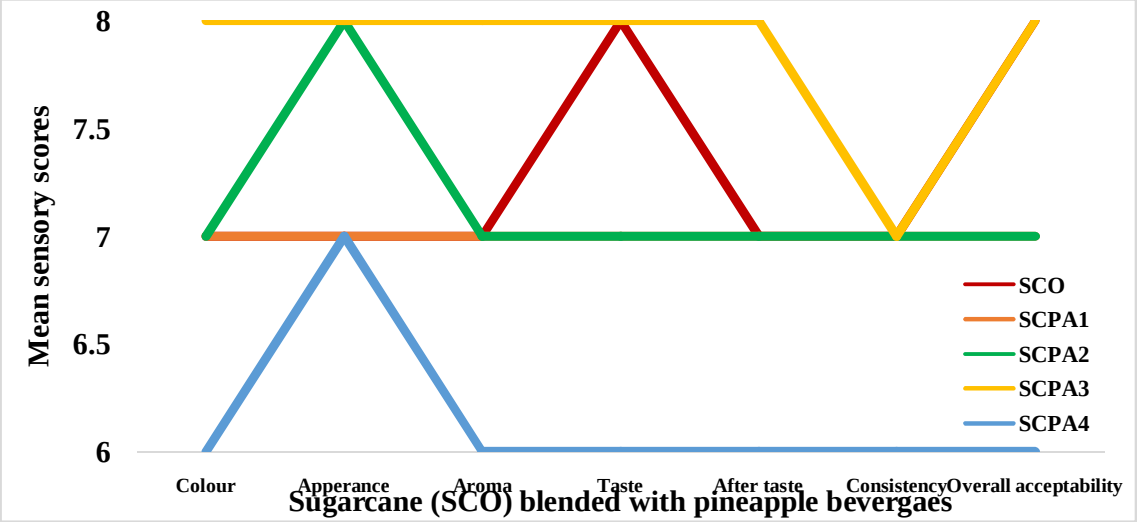

Figure 3**Mean sensory scores of sugarcane variety (Co86032)blended pineapple beverages**

Note:SCO: Co86032sugarcane variety
SCPA1: Sugarcane juice (50): Pineapple juice (50)
SCPA2: Sugarcane juice (60): Pineapple juice (40)
SCPA3: Sugarcane juice (70): Pineapple juice (30)
SCPA4: Sugarcane juice (80): Pineapple juice (20)

Sensory evaluation of sugarcane variety(Co86032) with orange blended beverages: Figure 4displayed the average sensory rating for the sugarcane variety(Co86032)when paired with orange. Among the five samples SCOA3 had the highest average sensory score (8.00±0.00) for colour. After that came SCO, SCOA1, SCOA2 and SCOA4 each of which scored 7.00±0.00. The following ranking of the appearance related sensory ratings was done in descending order: For SCO, SCOA1 and SCOA4 it was 8.00±0.00 while for SCOA2 andSCOA3 it was 7.00±0.00.

Regarding aroma, the control sample mean sensory score was 7.00±0.00. Among the experimental samples SCOA1, SCOA4 and SCOA2 all had identical mean sensory scores of 8.00±0.00 with SCOA1 having the lowest mean sensory value of 6.00±0.00. SCO (8.00±0.00), SCOA1 (6.00±0.00), SCOA2 (7.00±0.00), SCOA3 (8.00±0.00) and SCOA4 (7.00±0.00) were the average sensory assessments for taste. The sugarcane variety combined with orange beverages in SCOA3 had the greatest average sensory score for the flavour metric. The following ranking of the sensory assessments for after taste was done in ascending order: The following values are listed: 6.00±0.00 for SCOA1 and SCOA4, 7.00±0.00 for SCOA2 and SCOA3 and 8.00±0.00 for SCO.

The average sensory assessments for consistency were lowest in SCOA1 (6.05±0.02) and highest in SCO, SCOA2, SCOA3 and SCOA4 (7.00±0.00). The samples SCOA3 and SCO scored 8.00±0.00, SCOA2 and SCOA4 scored 7.00±0.00 and SCOA1 scored 6.00±0.00 were the average sensory values for overall acceptability. The results were illustrated in Figure 4 clearly revealed that the experimental sample SCOA3 performed better than the control and other experimental samples in every sensory measurement. At $p \leq 0.05$, the difference was considered statistically significant.

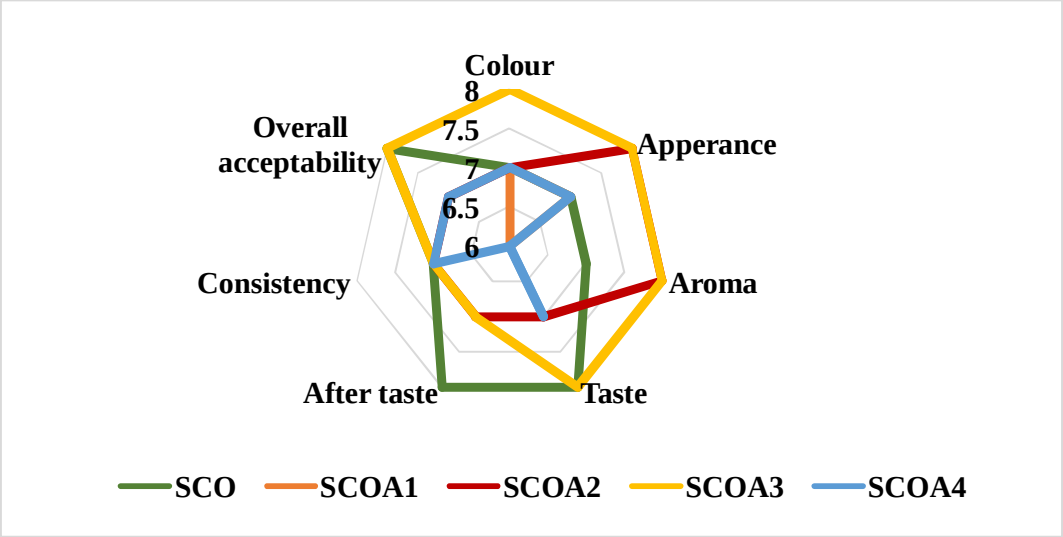

Figure 4**Mean sensory scores of sugarcane variety (Co86032)blended orange beverages**
Note:SCO: Co86032sugarcane variety
SCOA1: Sugarcane juice (50): Orange juice (50)
SCOA2: Sugarcane juice (60): Orange juice (40)
SCOA3: Sugarcane juice (70): Orange juice (30)
SCOA4: Sugarcane juice (80): Orange juice (20)

Sensory evaluation of sugarcane variety(Co86032) with apple blended beverages: Figure 5 illustrated that the average sensory scores for the sugarcane cultivar known as Co86032-SCO when combined with apple blended beverages. The experimental sample SCAP4 was awarded the highest mean sensory score for colour with a score of 8.00±0.00 at the time of the evaluation. This was followed by SCO, SCAP1, SCAP2 and SCAP3 all of which received a same score of 7.00±0.00 when they were evaluated.

In terms of appearance the average sensory scores ranged from 7.00±0.00 to 8.00±0.00 throughout the study. Out of the five samples the experimental sample SCAP4 had the highest mean sensory score which was 8.00±0.00. On the other hand, the samples SCO, SCAP1, SCAP2 and SCAP4 had the lowest mean sensory score which was 7.00±0.00 for

appearance. With a significance level of $p < 0.05$ it was seen that there was a significant difference between the experimental samples and the control sample. There was a variety of sensory scores for the aroma of sugarcane blended with apple beverages ranging from 8.00±0.00 (SCAP4) to 7.00±0.00 (SCO, SCAP1, SCAP2, SCAP3). The aroma score of the SCAP4 experimental sample was greater than the score of the control sample. At the time of comparison between the experimental samples it was seen that SCAP4 (8.00±0.00) displayed a high taste score but experimental sample SCAP1 (6.00±0.00) had a lower mean sensory score. At a significance threshold of p equal to or less than 0.05, the discrepancy between the samples was found to be statistically significant.

For taste the average sensory scores were provided as sample SCAP2, SCAP3 and SCO which was calculated to be 7.00±0.00. There was a wide range of sensory scores for aftertaste ranging from 6.00±0.00 to 8.00±0.00 on average. With a mean sensory score of 8.00±0.00 the SCAP4 was the experimental sample with the highest sensory score among the five samples. On the other hand, SCO and SCAP2 had a mean sensory score of 7.00±0.00. It was observed that SCAP1 and SCAP3 had the lowest mean sensory score for aftertaste with a score of 6.00±0.00. A statistically significant difference was observed between the experimental samples and the control sample, with a p-value of < 0.05 indicating that the difference was sufficiently significant.

With regard to consistency the samples SCAP2, SCAP3 and Control (SCO) were found to have a same mean sensory score of 7.00±0.00. With a score of 8.00±0.00, the experimental sample SCAP4 achieved the maximum possible score available. As far as consistency is concerned the experimental sample SCPA1 has the lowest mean score which was 6.00±0.00. In terms of overall acceptability, the experimental sample SCAP4 achieved the highest mean sensory score of 8.00±0.00 followed by SCO, SCAP2 and SCAP3 with same mean sensory score of 7.00±0.00. At a score of 6.00±0.00 the experimental sample SCAP1 received the lowest possible score. Figure 5 illustrated without a shadow of a doubt that SCAP4 has acquired the highest overall sensory acceptability score out of all five combinations surpassing both the control samples and the experimental samples.

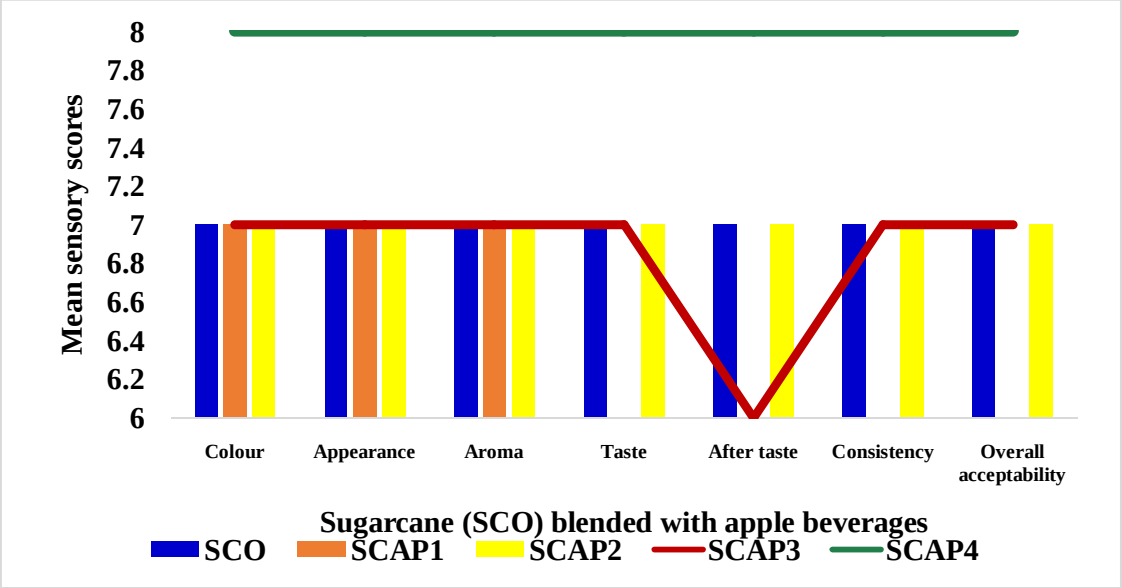

Figure 5**Mean sensory scores of sugarcane variety (Co86032)blended apple beverages**
Note:SCO: Co86032sugarcane variety
SCAP1: Sugarcane juice (50): Apple juice (50)
SCAP2: Sugarcane juice (60): Apple juice (40)
SCAP3: Sugarcane juice (70): Apple juice (30)
SCAP4: Sugarcane juice (80): Apple juice (20)

Sensory evaluation of sugarcane variety(Co86032) with beetroot blended beverages: In Figure 6 clearly showed that the average sensory rating for the sugarcane variety that were blended with beetroot. With a value of 8.00±0.00 the experimental sample SCBT4 obtained the highest average sensory score for colour out of the five samples that were evaluated during the study. This was then followed by SCO, SCBT2 and SCBT3 all of which obtained the same score of 7.00±0.00 while SCBT1 received a score of 7.05±0.03. According to the following descending sequence the sensory ratings for appearance were ranked as follows: 8.00±0.00 for SCO and SCBT4 respectively and 7.00±0.00 for SCBT1, SCBT2 and SCBT3.The average sensory score for the control sample in respect to aroma was 8.00±0.00 which was the highest score seen when compared to the scores obtained from the experimental samples. There were four samples left and all of them had the same sensory score of 7.00±0.00. These samples were SCBT1, SCBT2, SCBT3 and SCBT4. The mean sensory ratings for taste were as follows: SCO (8.00±0.00), SCBT1 (6.00±0.00), SCBT2 (7.00±0.00), SCBT3 (7.00±0.00) and SCBT4 (8.00±0.00). The sugarcane blended beetroot beverages received the highest average sensory score in experimental sample SCBT4 for the flavour which was the highest score ever achieved. The following is a ranking of the sensory assessments for after taste, in ascending order between the following: There was a lowest

score of 6.00±0.00 for SCBT1 and SCBT2, 7.00±0.00 for SCBT3 and 8.00±0.00 for SCO and SCBT4. When it comes to consistency the mean sensory evaluations were as follows: the highest was seen in SCO (8.00±0.00) and the lowestmean sensory score (6.00±0.00) was found in SCBT1 while the consistency value for SCBT2, SCBT3 and SCBT4 was 7.00±0.00. The average sensory scores are as follows: SCBT4, SCO scored 8.00±0.00, SCBT1, SCBT2 and SCBT3 scored 7.00±0.00. These results indicated that the overall acceptance was satisfactory. According to the findings that are presented in Figure 6 it was unquestionably demonstrated that SCBT4 exhibited greater performance in comparison to both the control sample and the experimental samples across all sensory measurements. At a significance threshold of $p \leq 0.05$, the difference under consideration was found to be statistically significant.

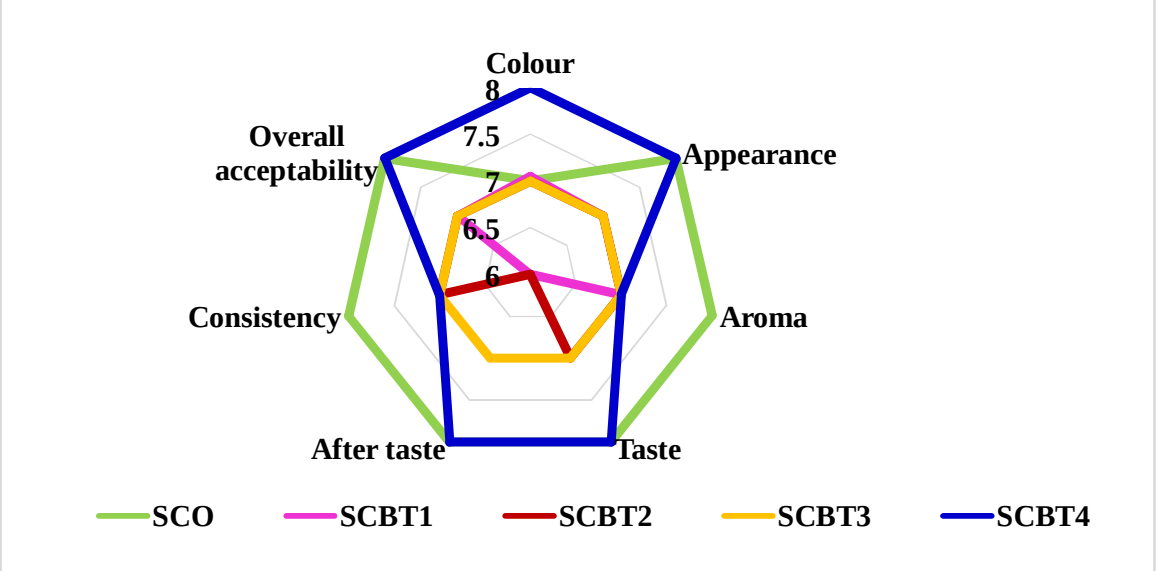

Figure 6**Mean sensory scores of sugarcane variety (Co86032)blended beetroot beverages**
Note:SCO: Co86032sugarcane variety
SCBT1: Sugarcane juice (50): Beetroot juice (50)
SCBT2: Sugarcane juice (60): Beetroot juice (40)
SCBT3: Sugarcane juice (70): Beetroot juice (30)
SCBT4: Sugarcane juice (80): Beetroot juice (20)

Sensory evaluation of sugarcane variety(Co86032) with carrot blended beverages:In Figure 7 offered a visual representation of the average sensory rating for the sugarcane variety that was paired with carrot juice. The SCCA4 and SCO samples obtained the highest average sensory score for colour with a value of 8.00±0.00. This was the case out of the five samples studied. Next in line was the SCCA2 and SCCA3 both of them were awarded a score of 7.00±0.00 while the SCCA1 sample received the lowest mean sensory score of 6.00±0.00. According to the following descending sequence the sensory ratings for appearance were

ranked as follows: The mean sensory score for these samples SCO and SCCA4 was 8.00±0.00 while the mean sensory score for SCCA1, SCCA2 and SCCA3 was 7.00±0.00. For the control sample (SCO) the average sensory score in respect to aroma was 8.00±0.00. Out of the four samples that were left SCCA4 had the greatest score which was 8.00±0.00. SCCA1 had the lowest score which was 6.00±0.00, SCCA2 and SCCA3 both had the same mean sensory score, which was 7.00±0.00. The mean sensory ratings for taste were as follows: SCO (8.00±0.00), SCCA1 (6.05±0.02), SCCA2 (7.00±0.00), SCCA3 (8.00±0.00) and SCCA4 (8.00±0.00).

With regard to the sugarcane blended carrot beverages the taste measure received its highest average sensory score in SCCA4 of all the beverages. The following is a ranking of the sensory assessments for after taste, in ascending order between the following: If the SCCA1 is less than 6.00±0.00, then the SCCA2 and SCCA3 were less than 7.00±0.00, the SCCA4 and SCO are less than 8.00±0.00. The mean sensory assessments revealed that SCCA4 and SCO had the highest consistency values (8.00±0.00) while SCCA1 had the lowest consistency value (6.00±0.00). On the other hand, the consistency value for SCCA2 and SCCA3 was 7.00±0.00. The average sensory scores for overall acceptability were as follows: SCO, SCCA4, SCCA3, and SCCA2 each scored 8.00±0.00 whereas SCCA1 scored 6.95±0.04which was the lowest mean sensory score when compared with other samples for overall acceptability.

According to the findings that are presented in Figure 7 it was demonstrated that the experimental sample SCCA4 had greater performance in comparison to both the control sample and the experimental samples across all sensory measurements. At a significance threshold of $p \leq 0.05$, the difference under consideration was found to be statistically significant.

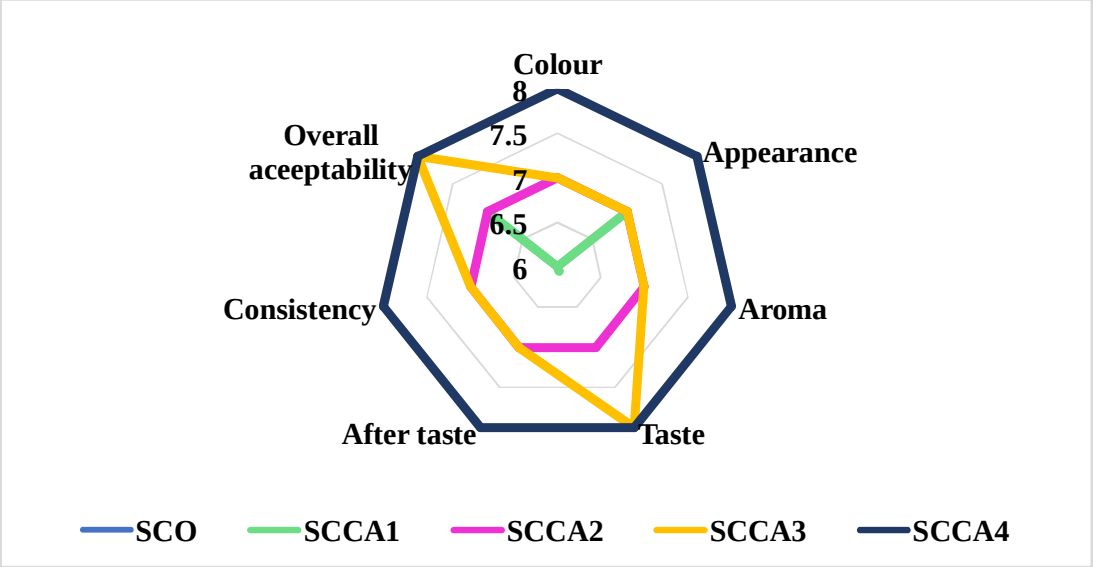

Figure 7**Mean sensory scores of sugarcane variety (Co86032)blended carrot beverages**
Note:SCO: Co86032sugarcane variety
SCCA1: Sugarcane juice (50): Carrot juice (50)
SCCA2: Sugarcane juice (60): Carrot juice (40)
SCCA3: Sugarcane juice (70): Carrot juice (30)
SCCA4: Sugarcane juice (80): Carrot juice (20)

Health benefits: The sugarcane juice contains a vital component called glycolic acid which has numerous beneficial effects on the epidermis. It hydrates the skin, prevents ageing, diminishes blemishes and combat acne. In addition, it contains a high concentration of phytonutrients, proteins, soluble fibre, antioxidants and numerous other health-promoting compounds. It also aids in weight loss and is essential for treating health issues such as hyperacidity, gonorrhoea, enlarged prostate and cystitis (Singh *et al*., 2006). Due to its low glycaemic index diabetic patients can enjoy this sweet drink without fear and it helps to rehydrate the body rapidly after prolonged exposure to heat and physical activity (Rawat and Pokhriyal, 2014).

Conclusion: The current study concluded that the sugarcane variety (Co86032) was blended with selected fruits and vegetables juices where the sugarcane blended beverages were combined in different ratios i.e., 100, 50:50, 60:40, 70:30, 80:20. The best acceptable sugarcane blended beverages among all the combinations were SCWA2 (Sugarcane-60:Watermelon-40), SCPA3 (Sugarcane-70:Pineapple-30), SCOA3 (Sugarcane-70:Orange-30), SCAP4 (Sugarcane-80: Apple-20), SCBT4 (Sugarcane-80:Beetroot-20) and SCCA4 (Sugarcane-80:Carrot-20). As the quantity of fruit and vegetable juice blend increased the

sensory scores was declined it may be possibly due to the dominant taste of the fruit and vegetable juices and their intense aroma.

Challenges of the study: There is abundant availability during season but if once the crop is harvested the sugarcane is not available till the next crop. The difficulty was faced while getting the raw material, sugarcane cultivators from Rudrur to Rajendrangar due to long distance.

Future scope of study: In order to determine the possible advantages of consuming sugarcane blended beverages, it is necessary to conduct additional research on its nutritional and anti-nutritional components.

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Conflict of Interest: The authors did not report any potential conflict of interest.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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Details of the AI usage are given below:

1.
2.
3.

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