



## DEVELOPMENT OF SODIUM ENRICHED OLIVE COCONUT DRINK FOR ATHLETES

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### ABSTRACT

Rehydration after exercise requires replacement of electrolyte, primarily sodium lost in sweat. Coconut water which contains sodium, chloride, potassium and glucose as a rehydration fluid. Recently, attention has been given to coconut water, a natural alternative to manufactured sports drink, within initial evidence indicating efficacy with regard to maintaining hydration. Therefore the present study was designed with the aim of developing sodium enriched olive coconut drink which helps in maintaining a balance between sodium and potassium as required by athletes. Sodium Enriched olive Coconut drink was developed. One variation was done and named as jaljeera Coconut drink. They both were compared with the standard drink (Gatorade). Sensory evaluation was done by both hedonic and composite scale, evaluated by untrained and trained 10 panelist. The results revealed that the mean score of sodium enriched olive coconut drink is 8.4 which is lie between 8-9 i.e. like extremely and like very much in hedonic scale. the nutritional value of sodium enriched olive coconut drink, the total energy was 233kcal, total sodium content was 826.8mg and total potassium content was 788.8mg in 250ml of drink. This study concluded that this drink was acceptable by the subjects and can be used as a natural and alternative to manufactured sports drink with regarding the maintenance of hydration.

**KEYWORDS:** Coconut water, rehydration, athletes.

### INTRODUCTION

Coconut water which contains sodium, chloride, potassium and glucose as a rehydration fluid. Rehydration after exercise requires replacement of electrolyte, primarily sodium lost in sweat. Recently, attention has been given to coconut water, a natural alternative to manufactured sports drink, within initial evidence indicating efficacy with regard to maintaining hydration. As it is a sterile and pure liquid, coconut water has been a religious symbol for a long time. In Asia, and especially in India, tender, i.e., immature, coconuts are offered as ceremonial gift and serve as purification media at traditional events.<sup>[2]</sup> Coconut water however, has been used as an oral rehydration in patients with diarrhea to replace fluid loss from the gastrointestinal tract. And in an extreme situation in short-term intravenous hydration in a patient. In comparison with nutrient broth, using sterilized clarified coconut water as a growth medium reduced the lag phase and enhanced the log phase of eight different microorganisms including *E. coli* and *S. aureus*. Furthermore, after sterilization and appropriate conditioning, a storage period of six months at ambient temperature did not affect the microbial growth capacity of coconut water. A recent review of the

chemical and biological properties of coconut water detailed the biological functions of these different cytokines in both plant and human systems the presence of both polyols and Phyto hormones could explain the growth promoting action of coconut water.

Rehydration after exercise requires replacement of electrolyte, primarily sodium lost in sweat. Rapid and complete restoration of fluid balance after exercise is an important part of the recovery process. Heavy sweating during exercise can cause body fluid losses in excess of 1 liter per hour. Individual must ingest sufficient fluid to recover from their dehydrated state. Rehydration after exercise not only replacement of volume loss but also replacement of electrolyte primarily lost of sodium loss in sweat. Such sodium loss can result in complete rehydration and many predispose the athlete to heat cramp during subsequent exercise.<sup>[11]</sup>

### MEHODOLOGY

The study was done under four phases. Phase I was product development. Sodium Enriched olive Coconut drink was developed. The ingredients were used coconut water Coconut water (100ml), Mint leaves extract

(40ml), Olive paste (60ml) Lemon juice (5gm) and Table salt (2gm). One variation was done and named as jaljeera Coconut water. They both were compared with the standard drink (Gatorade). Phase II include sensory evaluation of the samples was carried out using 10 untrained panelists from Manav Rachna International University. A nine-point Hedonic scale one (1) and nine (9) representing “extremely dislike” and “extremely like”, respectively, was used. Composite scale was also used to evaluate the sample by 10 trained panelists. The qualities assessed include appearance, texture, colour, taste, aroma, mouth feel and overall acceptability. Phase III includes proximal analysis of the accepted product. The proximal analysis was done for energy contents were determined by the AOAC 2000. Potassium and sodium was determined using the standard method of (AOAC, 2010). The last phase was statistically test was done by using SPSS software 20 version. The analysis includes mean, standard deviation, ANOVA for comparative results.

## RESULT AND DISCUSSION

**Table 1: Distribution of Subjects on the Basis of Hedonic Scoring.**

S. N.	Variables	Gatorade	Jaljeera Coconut drink	Sodium enriched coconut drink
9	Like extremely	N (%)	N (%)	N (%)
8	Like very much	4(40%)	2(20%)	1(10%)
7	Like moderately	3(30%)	2(20%)	5(50%)
6	Like slightly	2(20%)	0(0%)	3(30%)
5	Neither like nor dislike	1(10%)	2(20%)	1(10%)
4	Dislike slightly	1(10%)	2(20%)	0(0%)
3	Dislike moderately	0(0%)	0(0%)	0(0%)
2	Dislike very much	0(0%)	0(0%)	0(0%)
1	Dislike wxtremely	0(0%)	1(0%)	0(0%)

**Table 3: Mean acceptability of attributes between the gatorade, jaljeera coconut drink and sodium enriched olive coconut drink by composite scoring.**

Variables	Gatorade	Jaljeera coconut drink	Sodium enriched olive coconut drink	P-value (ANOVA)
Appearance	18.40±1.64	15.10±3.07	16.60±3.20	.009
Color	18.50±2.01	14.80±3.29	15.80±3.25	.011
Aroma	16.30±3.46	13.60±4.52	11.80±3.67	.050
Taste	33.50±5.50	30.00±5.03	28.50±7.2	.179
Overall	21.57±18.17	18.17±3.21	19.22±3.39	.001

Table 3 depicted that the mean acceptability Score of attributes between the samples by composite scoring. In appearance, Gatorade had the highest mean value 18.40±1.64 and jaljeera coconut drink had the least mean value 15.10±3.07 and the differences was statistically significant ( $p > 0.05$ ) as determined by one way ANOVA. For color, Gatorade had the highest mean value 1

Table 1 depicted the scoring of the subjects by 9 point hedonic scale. In hedonic scale there are 9 rating, like extremely, like very much, like moderately, like slightly, neither like nor dislike, dislike slightly, dislike moderately, dislike very much, dislike extremely. The data revealed that Gatorade was extremely liked by the subject (40%). 30% of subjects like it very much, 20% of subjects like it moderately, whereas only 10% reported neither like nor dislike. Regarding Jaljeera coconut drink, was extremely liked by the subjects (20%), 20% liked it very much, 20% liked it slightly, 20% reported neither like nor dislike. Regarding, Sodium Enriched Olive Coconut Drink, 10% subjects extremely liked the drink, 50% reported they like very much the drink, 30% reported moderately, whereas 10% reported liked it slight.

**Table 2: Mean score of the products by hedonic scale.**

Sample	Mean Score
Gatorade	8.5
Jaljeera coconut drink	5.3
Sodium enriched olive coconut drink	8.4

Table no 2 depicted that the mean score of Gatorade is 8.5 which is lie between 8-9 i.e. like extremely and like very much in hedonic scale. The mean score of Jaljeera coconut drink is 5.3 which is lie between 5-6 i.e. neither like nor dislike and like slightly in hedonic scale. The mean score of sodium enriched olive coconut drink is 8.4 which is lie between 8-9 i.e. like extremely and like very much in hedonic scale.

8.50±2.01 whereas jaljeera coconut drink had the lowest mean value 14.80±3.29. The result was statistically significant ( $p > 0.05$ ) among the samples. In aroma Gatorade had the highest mean value 16.30±3.46 and sodium enriched olive coconut drink had the lowest mean value 11.80±3.67. The result was statistically significant ( $p > 0.05$ ) among the samples. In taste

Gatorade had the highest mean value  $33.50 \pm 5.50$  and sodium enriched olive coconut drink had the lowest mean value  $28.50 \pm 7.2$ . The result was statistically significant ( $p=0.179$ ) among the samples. Overall Gatorade had the highest mean value  $21.57 \pm 18.17$  and jaljeera coconut drink had the lowest mean value  $18.17 \pm 3.21$ . The result was statistically significant ( $p>0.05$ ) among the samples.

**Table 4: Nutritional value of sodium enriched olive coconut drink.**

Nutrients	Amount
Energy	233 kcal
Sodium	826.4mg
Potassium	788.8mg

Table no.1.5 revealed that the nutritional value of sodium enriched olive coconut drink, the total energy was 233kcal, total sodium content was 826.8mg and total potassium content was 788.8mg in 250ml of drink.

## CONCLUSION

This study concluded that this drink was acceptable by the subjects and can be used as a natural and alternative to manufactured sports drink with regarding the maintenance of hydration.

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