



STANDARDIZATION OF ASH GOURD AND AMLA BASED INSTANT JUICE AND SOUP MIXES

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Abstract

Fruits and Vegetables are important in human diet and have a potential for the development of low cost beverages of high nutritional value. Even though many processed products are available, consumer prefers dehydrated products. Hence, there is a need to develop Instant mixes with prolonged shelf life. Therefore an attempt has been made to develop an Instant Juice and Soup mixes from Ash gourd and Aonla. Juice and soup samples were prepared with six different variation of each with different quantities of ingredients. Sensory evaluation was done for all the juice and soup samples. Among all, the juice sample of AGJ4 (7.30) and soup of AGS3 (8.40) were scored highest for overall acceptability. Best accepted Ash gourd juice samples subjected for dehydration for 7h and 8h at 60°C respectively. Consumer evaluation was done by taking 50 subjects and results revealed that, both the instant mixes were accepted by the consumers. It can be concluded that the blended instant mixes from Ash gourd and Aonla are the natural nutri-mix, which saves time for cooking and also provides additional nutrients.

Key words: Ash gourd, Aonla, Instant mixes.

Introduction

Beverages from fruits and vegetables are important in human diet, as they are pleasant and satisfying, because of their aesthetic and refreshing qualities. However, most of the carbonated beverages are thirst quenchers and will not provide any nutrients and beyond the reach of common man, because of their prices. Thus there is plenty of scope for the development of low cost beverages of high nutritional value using locally available fruits and vegetables. Even though many processed products are available, dehydrated products always have an upper hand in the consumer preferences.

Among all dehydrated products, Instant mixes gained popularity in the recent years, by way of providing convenience, hygienic, reduce drudgery, extensible shelf life, easy to carry so that it reduces the transportation cost especially to the armed forces and available in various packages and it requires very less time to be taken to prepare food (Premavalli *et al.*, 2005).

India is the world's largest producer of fruits and vegetables, but less than 2 per cent of fruits and vegetables are processed in the country (Ravindranath, 2005). Although there is 12 % of the world's production, the per capita vegetable consumption in India is only 135g / day as against the ICMR recommendation of 250g/day. To bridge this gap between production and consumption, it becomes essential to explore the vegetables which are nutritionally high and superior. To improve the nutritional value, the value added products can be developed to use in different convenient products using locally available fruits and vegetables.

Ash gourd (*Benincasa hispida*), is also one of the locally available vegetable, belongs to the family cucurbitaceae. Originating from China. It is widely grown in Uttar Pradesh, Madhya Pradesh, Maharashtra, Kerala, Karnataka, Andhra Pradesh and Tamil Nadu. It is called by different names in different languages viz., Khumbaphala, Boodugumbala, Boododa gummadi kaya, Neerpoosanikai & kumbalanga. Ash gourd is rich in calcium (930mg), iron(0.8mg) and has less protein (0.4g) and fat (0.4g) compared to the other gourds (Gopalan *et al.*, 2007).

Aonla (*Emblia officinalis* Gerth. Sync (*Phyllanthus emblica*) also known as Indian Gooseberry, is a minor fruit belongs to the family Euphorbiaceae. It is said to be native of India. It is also known as amla, amalki, amla and nelli in different parts of India. In India it is commercially cultivated in Uttar Pradesh followed by Gujarat, Tamil Nadu, Rajasthan, Karnataka and West Bengal. It has acquired wide popularity all over the world due to its medicinal properties and is frequently recommended in both the Ayurvedic and Unani Systems of medicine.

The fruit is highly nutritious and it is the richest source of vitamin 'C'. Amla fruit contains fiber (0.8- 2.0 per cent), total soluble solids (10 -64 per cent), acidity (1-4 per cent), vitamin 'C' (700- 900 mg /100g), pectin (2.4 – 3.1 per cent) and phenols (2 – 3 per cent) (Singh *et al.*, 1997).

Ash gourd is bland in taste and pale in colour and Aonla is astringent in taste, hence it is not consumed widely for the table purpose but the excellent nutritive and therapeutic value of this fruit & vegetable offers a great potential for processing into various quality products. In spite of having amazing health benefits, ash gourd is not much consumed. Very little attention has been given for the development of the processed products of ash gourd.

Hence, recognition of the above needs, an attempt has been made to develop an Instant Juice and Soup mixes from such a promising Ash gourd and Aonla after considering their nutraceutical properties and their nutrients.

Material and Methods

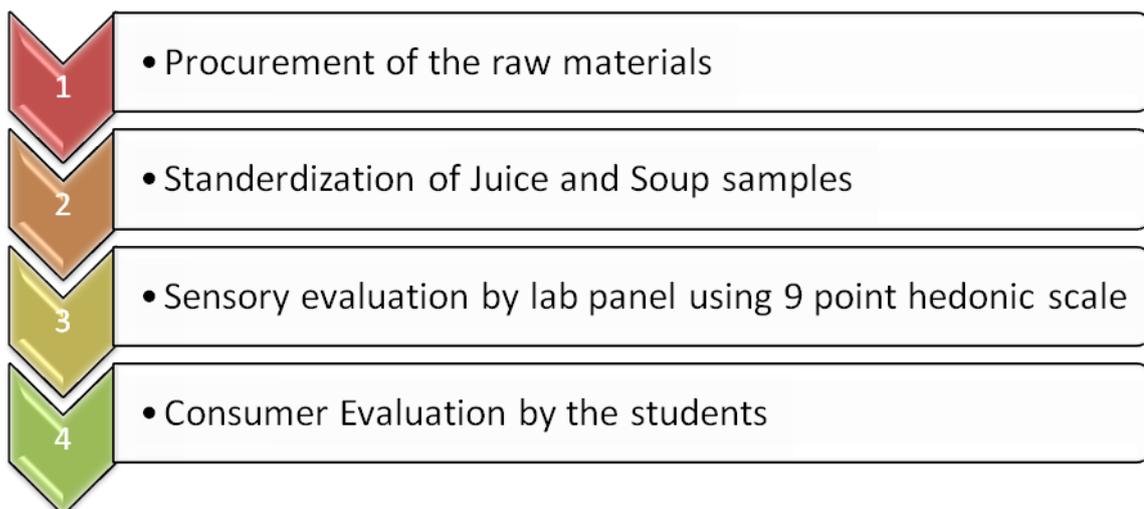


Fig 1: Study Design

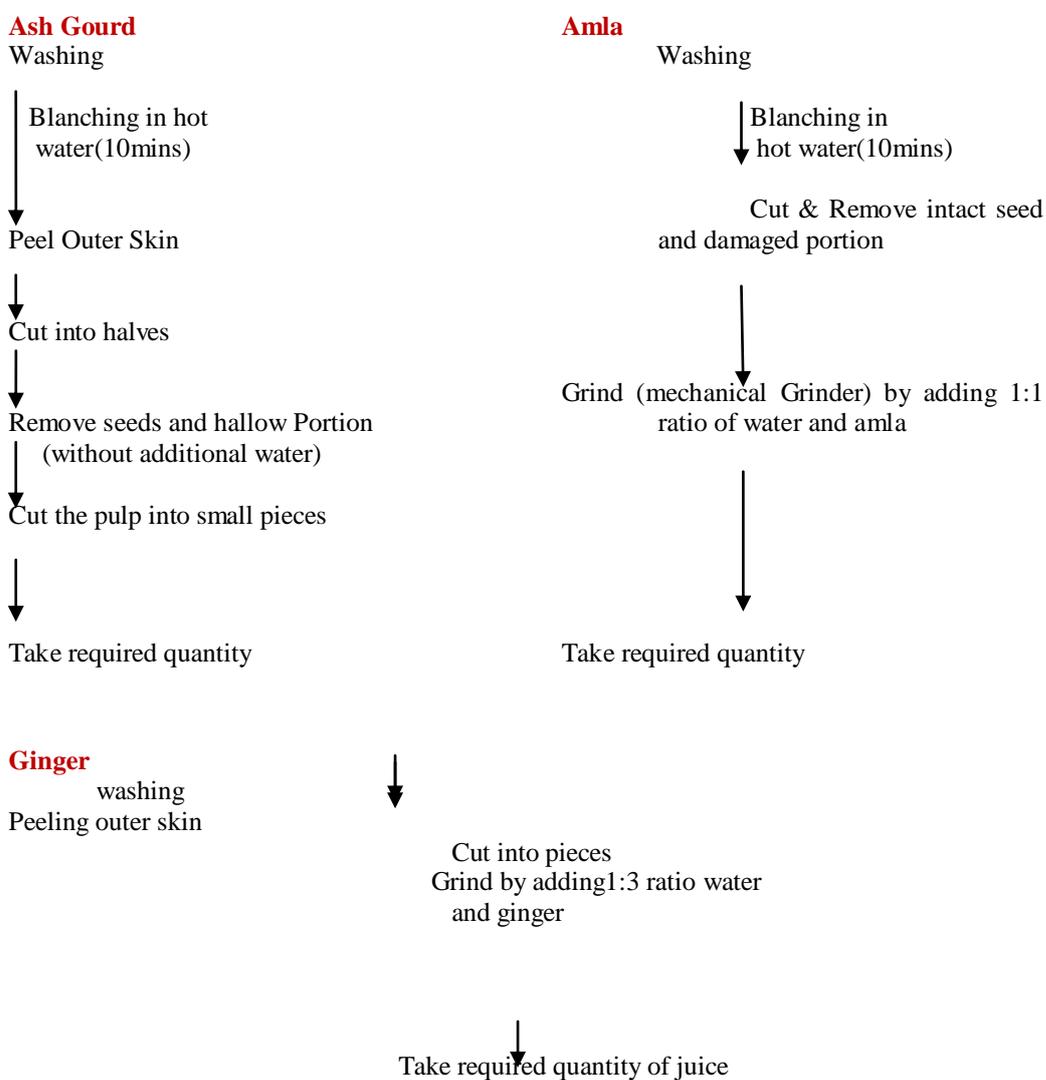


Fig.2: Extraction of juices from Ash gourd, Amla and Ginger

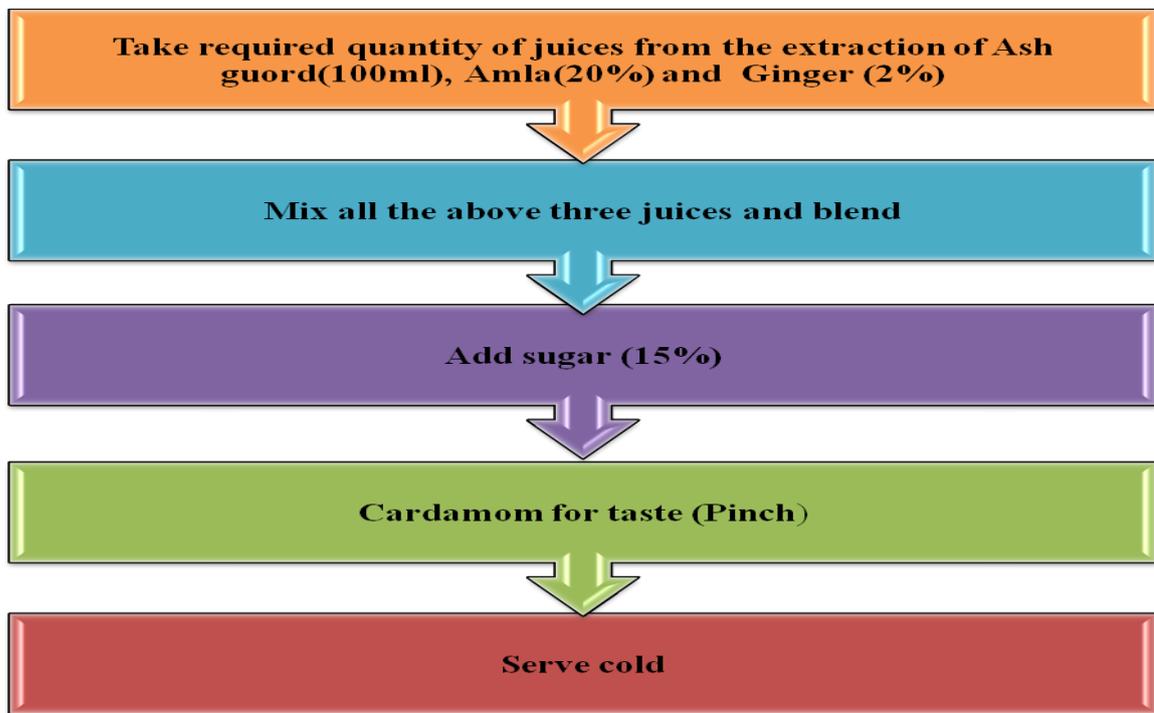


Fig. 3 : Preparation of Ash gourd and Amla blended juice

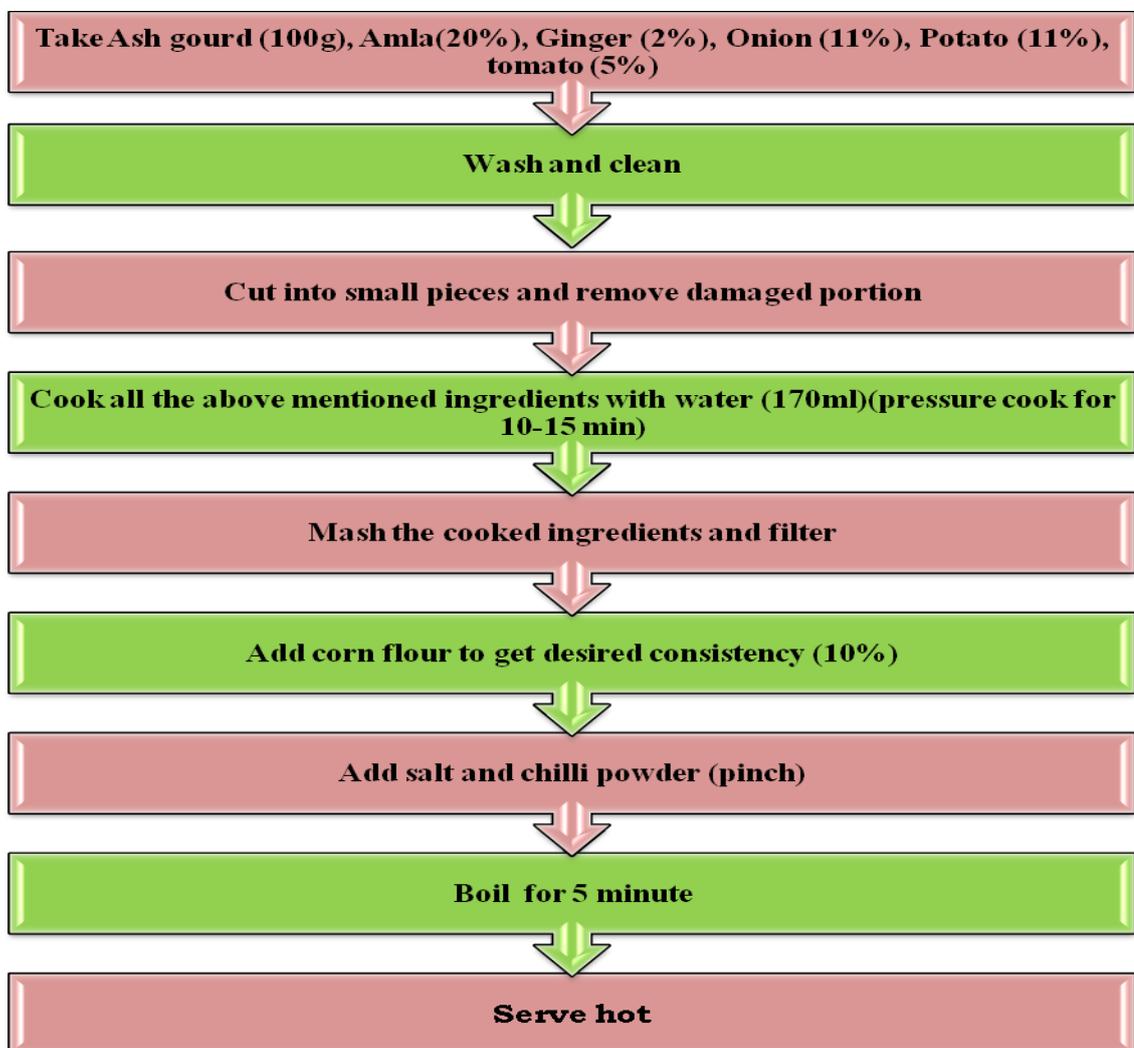


Fig 4 : Standardized Soup samples of Ash gourd in different proportions

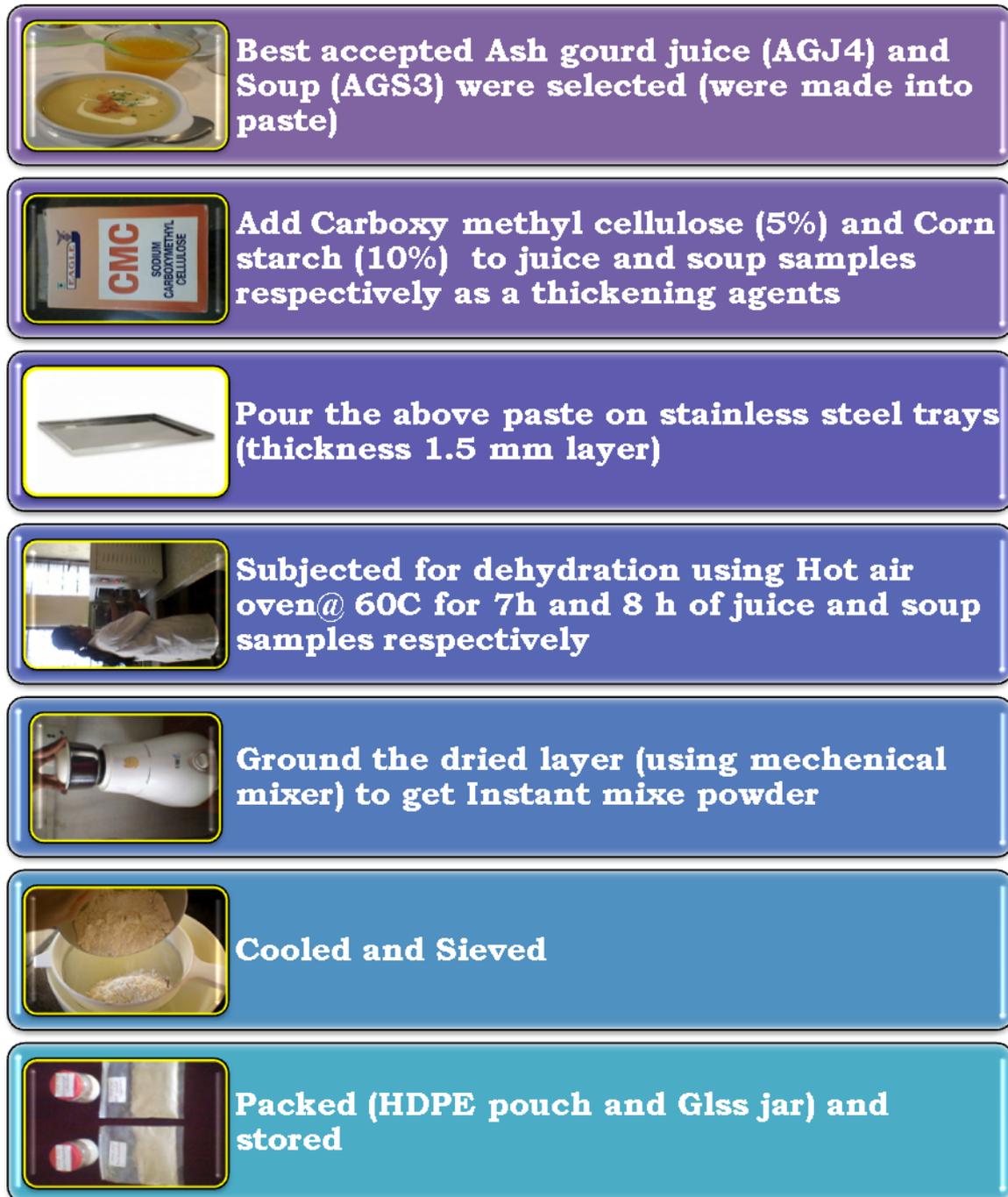


Fig. 5 : Preparation of flow diagram of dehydration to get Instant juice and soup mixes

Results and Discussion

Standardization:

The Raw Materials were procured from the local market namely Ash gourd, amla, sugar, potato, ginger, tomato, pepper and binders (CMC(carboxy methyl cellulose) and corn starch) and other spices. Standardization was done by blending ash gourd, amla and ginger juices in different quantities. Standardization of juice and soup samples were done by extracting juices from ash gourd, amla and ginger and blended in different proportions. Figures-2, 3 and 4 shows the flow chart for methodology for the extraction, juice preparation and soup preparation, respectively.

Six different variations of ash gourd juice samples viz. AGJc (control), AGJ1, ACJ2, AGJ3, AGJ4 and AGJ5, were prepared using different proportions of Ash gourd, amla, ginger, carboxy methyl cellulose and sugar. Whereas, ash gourd soup samples viz. AGSc (control), AGS1, AGS2, AGS3, AGS4 and AGS5 were developed with different proportions of Ash gourd ,amla ,ginger, tomato, potato, onion, spices and corn starch to improve taste and flavour of the product. The standardized juice and soup samples are presented in Table – 1 and Table – 2, respectively.

Table 1: Standardization of Juice samples

Varitions	Ash gourd juice (ml)	Aonla juice (%)	Ginger juice (%)	CMC (%)	Sugar (%)	Water (ml)	Juice yield (ml)
AGJC	100	-	-	5	15	70	185
AGJ1	100	20	2	5	15	70	212
AGJ2	200	30	2	5	30	140	407
AGJ3	300	40	2	5	45	210	597
AGJ4	400	50	2	5	60	280	792
AGJ5	500	60	2	5	75	350	992

AGJ- Ash gourd Juice

Table 2 : Standardization of Soup

Varitions	Ash gourd juice (ml)	Aonla juice (%)	Ginger juice (%)	Onioin (%)	Potato (%)	Tomato (%)	Corn starch (%)	Water (ml)	Soup Yield (ml)
AGSC	100	-	-	-	-	5	10	70	307
AGS1	100	20	2	11	11	5	10	70	329
AGS2	200	30	2	22	22	10	10	55	636
AGS3	300	40	2	33	33	15	10	33	943
AGS4	400	50	2	44	44	20	10	11	1250
AGS5	500	60	2	55	55	25	10	88	1557

AGS- Ash gourd Soup

**Plate 1: Standardized Juice Samples of Ash gourd in different proportions**

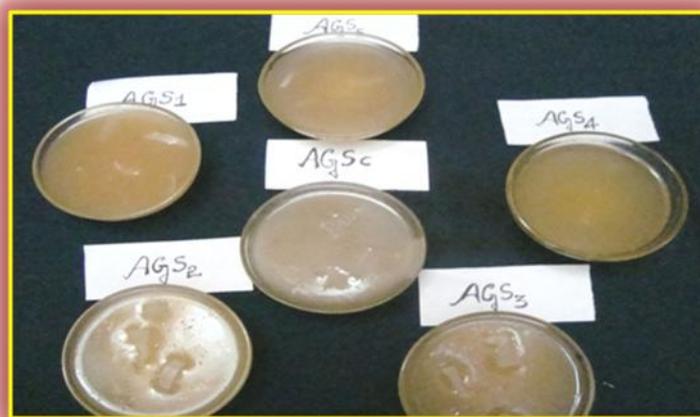


Plate 2: Standardized Soup Samples of Ash gourd in different proportions

Sensory Evaluation:

Sensory Evaluation of the Juice and soup Samples were conducted before and after dehydration by a lab panel of semi-trained judges using a 9 point Hedonic scale. Sensory scores of juice and soup samples are presented in Table –3 and Table –4 respectively.

Table 3: Sensory evaluation of standardized Juice samples before dehydration (n =11)

Samples	Colour	Appearance	Consistency	Flavour	Taste	Overall acceptability
AJGC	7.30	7.10	7.10	5.50	5.30	6.00
AJG1	6.60	6.80	6.90	5.50	4.80	5.80
AJG2	6.00	6.20	7.10	5.50	4.40	5.00
AJG3	6.50	6.50	7.50	6.20	5.70	6.00
AJG4	7.80	7.40	7.70	7.20	7.10	7.30
AJG5	6.50	6.80	7.50	5.50	6.90	5.40
F-value	*	NS	NS	*	*	*
SEm±	0.30	0.28	0.28	0.42	0.39	0.31
CD	0.87	-	-	1.20	1.13	0.89

* Significant at 5% level, NS- Non significant, AGJ- Ash gourd juice

Table 4: Sensory evaluation of standardized Soup samples before dehydration (n =11)

Samples	Colour	Appearance	Consistency	Flavour	Taste	Overall acceptability
AJSC	7.10	6.70	6.30	6.40	6.50	6.60
AJS1	7.00	6.80	6.50	6.70	7.00	6.80
AJS2	7.40	7.20	7.00	7.30	7.20	7.00
AJS3	7.90	8.10	8.30	8.40	8.80	8.40
AJS4	7.80	7.80	7.80	7.70	8.10	7.70
AJS5	7.80	7.70	7.60	7.30	7.80	7.60
F-value	*	*	*	*	*	*
SEm±	0.16	0.24	0.17	0.23	0.16	0.16
CD	0.47	0.68	0.49	0.65	0.45	0.47

* Significant at 5 % level, AGS- Ash gourd soup

Sensory scores for juice samples was highest in AGJ4 i.e. 7.30 and AGJ2 scored lowest i.e. 5.00. The values for AGJc and AGJ3 scored 6.00 and they were on par with each other. Whereas, the soup samples of AGS3 scored maximum (8.40) and AGSc scored minimum i.e. 6.60.

The best accepted juice sample i.e. AGJ4 and soup sample AGJ3 were subjected for dehydration and the developed Instant mixes were given for sensory evaluation by a lab panel of semi –trained judges using 9 point Hedonic scale. The scores are presented in Table -5.

Table 5: Sensory evaluation of Instant Mixes after dehydration Juice and Soup Samples before Dehydration (n =11)

SAMPLE PARAMETER →	JUICE MIX (AGJ4)	SOUP MIX (AGS3)
↓ Colour	7.40	8.10
Appearance	7.20	8.40
Consistency	7.20	8.30
Aroma	7.20	8.60
Taste	7.10	8.40
Overall acceptability	7.20	8.60
F-value	NS	NS
SEm±	0.164	0.226
CD	-	-

NS- Non significant

The results revealed that, the scores of juice mix for appearance, consistency, flavour and overall acceptability scored less i.e. 7.20 and the values were on par with each other except, for taste i.e. 7.10. The scores for colour and appearance have increased and aroma, taste and overall acceptability have decreased. But, consistency scored same after dehydration.

When both Instant mixes were compared, the data revealed that soup mix scored highest i.e. 8.60, When compared to juice mix i.e. 7.20 for overall acceptability and there was no significant difference found between the sensory characteristics.

Table 6 : Dehydration of best accepted juice (AGJ4) and soup (AJS3) samples

Samples	Dehydration method	Drying duration	Moisture (%)		Yield(g)	PH	
			Before	After		Before	After
AGJ4	Hot air oven	7h	83	3.30	100:10	4.39	4.10
AGS3	drying	8h	85	3.20	100:15	4.32	4.11

Consumer evaluation of the Instant mixes:

The best accepted Instant mixes were further served to the consumers for testing general acceptance pattern. Twenty five students from UG girl’s hostel and twenty five students of PG girl’s hostel of UAS, GKVK, Bangalore were randomly selected and given the product and they scored the beverages with a simple evaluation sheet. Information obtained was analyzed to find out; the level acceptance of beverages and expressed under different parameters (highly acceptable, acceptable and unacceptable). The results have been discussed in Fig-7 & Fig-8 respectively.

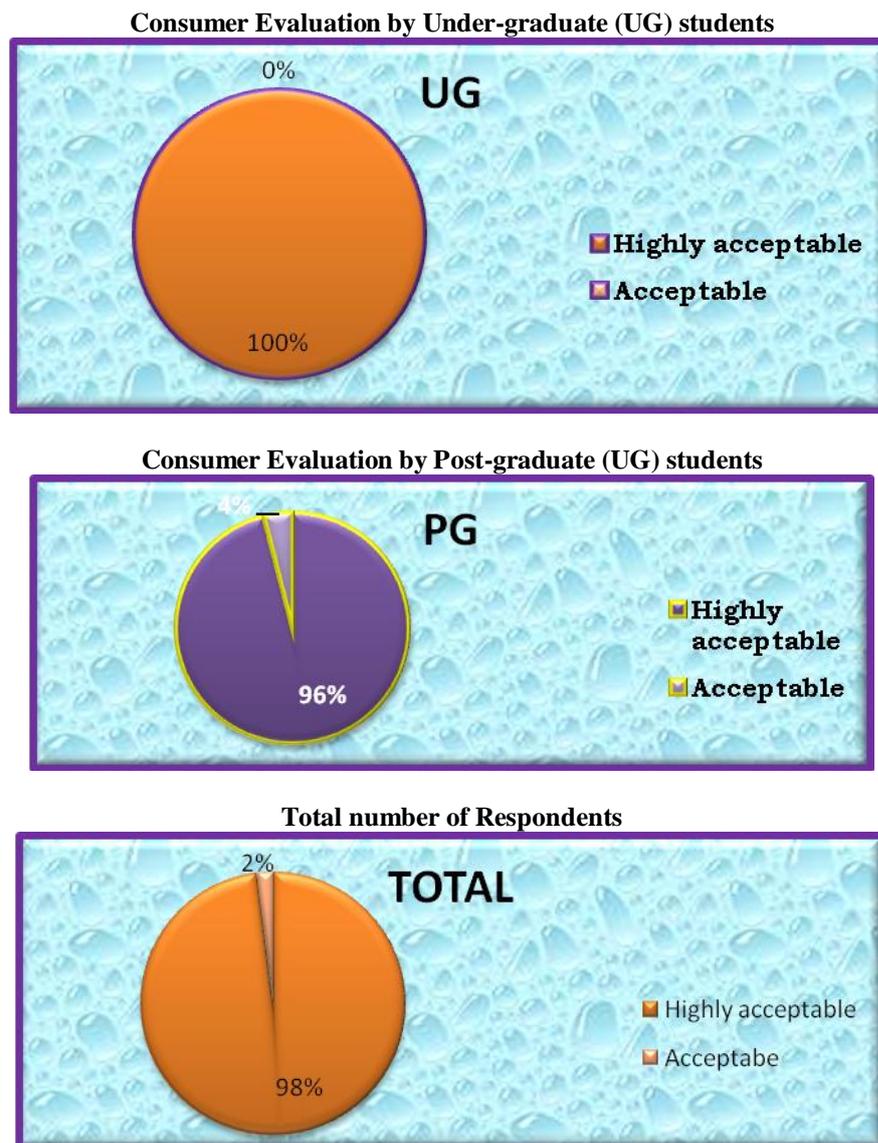
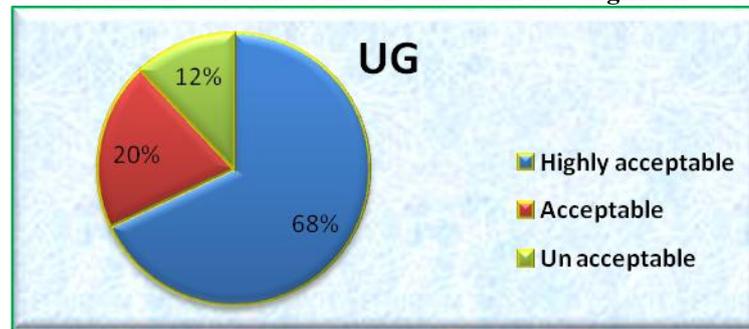
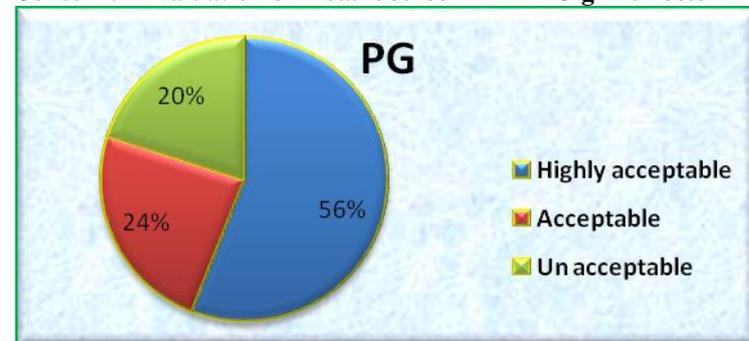
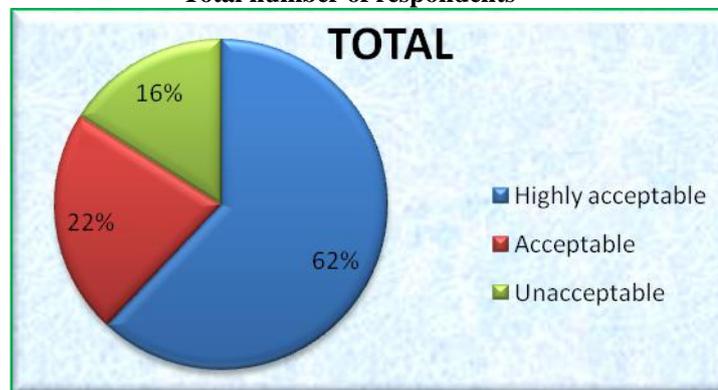


Fig. 7: Consumer Evaluation of Instant Soup Mixes

Consumer Evaluation of Instant Juice Mix in UG girl's hostel**Consumer Evaluation of Instant Juice Mix in PG girl's hostel****Total number of respondents****Fig. 8 : Consumer Evaluation of Instant Juice Mixes**

In the present study developed instant mixes subjected to under graduates (n=25) and post –graduates (n=25) of UAS, GKVK, Bangalore to know to what extent the beverages were liked, disliked and their comments for improvements. The results showed that juice mix was highly accepted and appreciated by 68 % of UG and 56 % of PG students. They suggested improving the colour of the product. But, few of the respondents from UG (12 %) and PG (20 %) they did not like the colour and they reported that, they were not ready to buy the juice.

However, soup mix was highly accepted by > 95 per cent of respondents from both UG and PG girl's students and they were ready to purchase if it is available in the market. To conclude that the developed instant mixes were accepted by most of the Consumers.

Summary and Conclusion

The study conclude that, the Ash gourd and amla based instant mixes from the present study can be serve as a successful dietetic drink with or without addition of salt and sugar for the subjects with wide number of conditions and disorders viz. obesity, diabetes, cardiovascular problems and general health problems. Since, it has good quantity of ascorbic acid and calcium, it can be recommended for the school going children to geriatrics (which includes adolescent girls and adult women). This product can also be recommended to maintain electrolyte balance and also as a refreshing drink.

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