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FORMULATION OF VALUE ADDED NUTRITIOUS INSTANT DALIYA MIX

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ABSTRACT

Nutrient dense food ingredients viz. spray dried papaya powder, skimmed milk powder and niger seed were used for formulation of value added instant daliya mix. The highly accepted variation of basic and value added daliya mix was analyzed for nutritional quality. Most accepted value added daliya mix was stored in polythene & laminated aluminium pouch and evaluated for shelf life quality. The findings evidenced that value added instant daliya mix contained significantly highest ($P<0.01$) amount of protein (16.19g), total minerals (2.38g), fiber (1.62g), calcium (196mg), phosphorus (335mg), iron (6.93mg), vitamin C (3.86mg), and β carotene (386 μ g) than basic mix. Results also reported that value added daliya had significantly ($P<0.01$) better in-vitro protein digestibility (69.36%) and iron bioavailability (56.66%). The shelf life study denoted that daliya mix was organoleptically acceptable after six month storage at ambient temperature. Effect of storage showed that moisture content was below 10 percent, peroxide value did not exceed 0.73 ± 0.01 meq/kg & reducing sugar 2.16 ± 0.06 g/100g. Though there was increase observed in stored samples, the total bacterial count did not exceed the safe levels of consumption.

Key words: Formulation, Value addition, Spray dried, Instant mix, Carica papaya, Daliya, Niger seed.

INTRODUCTION

Traditional foods have occupied a unique place in the dietary practices of population. A large number of grain based traditional foods have been processed and their instant mixes have been developed. They are gaining popularity but such mixes are prepared using refined cereals and pulses which are deficient in essential nutrients.

In recent years, consumers have become more health conscious in their food choices but have less time to prepare healthful meals. As a result the market demand for “minimally processed” or “lightly processed” foods has rapidly increased. Fortification and value addition are the most cost effective and sustainable strategy to address the problem of micronutrient malnutrition. Cereals or millets can be mixed with pulses in different proportion, reason being cereals are deficient in lysine and rich in methionine, while pulses are deficient in methionine and rich in lysine. Hence, mutual supplementation improves the protein quality by balancing the amino acid profile. Use of cereals and pulses as basic ingredients and nutrient rich foods for value addition can become a strategy for development of nutritious instant mixes.

Niger seed is very good source of nutrients. It can supply 23.9g protein, 39.0g fat, 17.1g carbohydrate, 300mg calcium, 515kcal energy and 56.7mg iron per 100gm (Gopalan, 2010). Among the commonly

consumed various nuts and oilseeds, niger seeds are richest source of iron and good source of protein & energy. Hence, it has a vital role to play in human nutrition.

In terms of nutrition, fruits are very good sources of several vitamins, minerals and dietary fibre, all of which are essential for good health. Papaya (*Carica papaya*) known as the wonder fruit of the tropics can provide the essential protective nutrition. Papaya is nutritious and has good therapeutic value (Singh 1998). The ripe papaya fruit contains large quantity of carotene. Regular consumption of papaya ensures a source of vitamin A and C, both of which are essential for good health.

Skimmed milk powder contain all twenty-one standard amino acids, high in mineral content such as calcium, phosphorus and provides water soluble vitamins. Skimmed milk powder is widely used in various sweets & frequently used in the manufacture of infant formula and for many athletic foods. This investigation was carried out with an objective to enhance the nutritional value of traditional food *daliya* with value addition of papaya, skimmed milk powder and other nutritious ingredients.

METHODOLOGY

SELECTION & PROCESSING OF INGREDIENTS

The ingredients required for formulation of

instant *daliya* mix were purchased from the market of Parbhani. The ingredients viz. wheat, green gram dhal, skimmed milk powder, spray dried papaya powder (*Carica papaya*), niger seed, jaggery, salt and fat were cleaned and stored for further research. Powdered green gram dhal & niger seeds, sieved through a scientific sieve of BS 30 were used. Jaggery was used in grated form for the experiment. For obtaining similar size wheat splits scientific sieve have particle size BS 20 was used.

STANDARDIZATION OF BASIC INSTANT DALIYA MIX

A basic *daliya* was standardized using the ingredients such as broken wheat, jaggery, salt and fat. Three variations were tried by changing the proportion of ingredients (Table 1). The prepared *daliya* from different variations was organoleptically evaluated for sensory characteristics by semi trained 20 panel members for its acceptability using five point ranking scale (Amerine et al., 1965). The highly accepted variation of *daliya* was selected as basic instant *daliya* mix for further comparison.

Table 1: Ingredient composition of basic instant *daliya* mix (g)

Ingredients	Variation I	Variation II	Variation III
Wheat broken	54	55	54
Salt	01	-	01
Fat	20	10	15
Jaggery	25	35	30

FORMULATION OF VALUE ADDED INSTANT DALIYA MIX

Four variations of value added instant *daliya* mix were formulated by changing the ingredients composition of basic *daliya* mix (Table 2) and the

products were prepared with steaming. The prepared four variations of *daliya* were evaluated organoleptically in comparison with basic variation and highly accepted variation was selected for further study.

Table 2: Ingredient composition of value added instant *daliya* mix (g)

Ingredients	Basic	A	B	C	D
Wheat broken	54	34	35	44	44
Green gram dhal	-	10	14	15	15
Skimmed milk powder	-	10	05	10	10
Papaya powder	-	10	-	05	-
Soy chunk powder	-	-	10	-	05
Niger seed powder	-	05	05	05	05
Salt	01	01	01	01	01
Fat	15	10	05	-	-
Jaggery	30	20	25	20	20

NUTRITIONAL EVALUATION OF STANDARDIZED BASIC AND VALUE ADDED INSTANT DALIYA MIX

The most accepted variation of value added instant *daliya* mix & standardized basic *daliya* mix and their products were analyzed for nutritional quality assessment. The parameters analyzed were moisture, total minerals, protein, total fat, fiber, calcium, phosphorus, iron, zinc, copper, manganese, vitamin „C“ and β carotene by AOAC procedures (1990). Apart from these the in-vitro protein digestibility & iron bioavailability of the products was determined using the method described by Mouliswar *et al.*, (1993). The values of carbohydrate, energy, water soluble vitamins such as B1, B2 & niacin were calculated by using the food composition tables (Gopalan *et al.*, 2010).

instant *daliya* mix was selected for shelf life study. It was packed in polythene pouches (P1) of 100 gauge & laminated aluminium pouches (P2). The samples were stored for a period of six months at ambient temperature (20.8 to 32.48°C). The samples were drawn fortnightly for assessing the quality in terms of moisture and organoleptic evaluation. Peroxide value, reducing and non reducing sugar were estimated at the beginning and at the end of storage period by Nelson-Somogyi method (Hawk *et al.*, 1952).

MICROBIAL EVALUATION

At the initial and final day of storage period microbial population was analyzed in both the packages by serial dilution agar plate technique given by Dubey and Maheshwari (2004).

SHELF LIFE STUDY OF FORMULATED VALUE ADDED NUTRITIOUS INSTANT DALIYA MIX

The best accepted variation of value added

STATISTICAL ANALYSIS

To analyze the data “t” test and analysis of variance (ANOVA) were used to compare the differences

in organoleptic scores and the differences in nutritional composition of products. The statistical analysis was carried out by following the procedures prescribed by Panse and Sukhatme (1985).

RESULTS AND DISCUSSION

ORGANOLEPTIC EVALUATION OF STANDARDIZED BASIC DALIYA MIX

The organoleptic evaluation scores for acceptability of basic recipe of the *daliya* are presented in Table 3. As per findings variation III of basic recipe secured highest scores for all the sensory parameters than other two variations therefore the ingredient composition of variation I was selected as standardized basic *daliya* mix. The results revealed that for organoleptic characteristics the mean scores ranked for colour, texture, taste, flavour and overall acceptability ranged from 4.40 to 4.60; 4.30 to 4.60; 4.25 to 4.50; 4.05 to 4.50 and 4.10 to 4.70 respectively. There was statistical significant difference in the scores for texture and overall acceptability at 1 per cent level of significance. Non significant difference in scores for colour, texture, taste and flavour was observed between three variations and scores obtained were at par.

ORGANOLEPTIC EVALUATION OF

FORMULATED VALUE ADDED NUTRITIOUS INSTANT DALIYA MIX

Four variations of fortified *daliya* mix were formulated by using the selected ingredients and were subjected for sensory evaluation against standardized basic recipe and the scores obtained are presented in Table 4. Results revealed that all variations of prepared *daliya* recorded the mean scores for colour, texture, taste, flavour and overall acceptability are varied from 3.55 & 4.60; 3.40 & 4.55; 3.05 & 4.60; 3.50 & 4.70 and 3.50 & 4.55 respectively. The sensory scores for different variations of formulated instant *daliya* prepared with variation „C” recorded highest scores in case of all sensory parameters viz., colour (4.60), texture (4.55), taste (4.60), flavour (4.70) and over all acceptability (4.55). Statistical analysis showed significant difference ($P < 0.01$) in the scores recorded for colour, texture, taste, flavour and overall acceptability between all variations.

The results of the sensory evaluation showed that the incorporation of green gram dhal (15%), skimmed milk powder (10%), papaya powder (5%), niger seed (5%) found to be acceptable with respect to all sensory parameters. Addition of fat found unacceptable in value added *daliya* that might be presence of hidden fat in niger seed. Skimmed milk powder & papaya powder has given creamy texture and improved taste of *daliya*.

Table 3-Sensory evaluation scores of standardization of basic *daliya* mix

Variation	Colour	Texture	Taste	Flavour	Overall acceptability	Total
I	4.40	4.30	4.25	4.05	4.10	21.1
II	4.50	4.40	4.35	4.35	4.30	21.9
III	4.60	4.60	4.50	4.50	4.70	22.9
Mean	4.50	4.43	4.36	4.30	4.36	21.95
F value	0.5NS	0.95NS	0.57NS	1.84NS	3.84*	
SE±	0.14	0.15	0.16	0.16	0.14	
CD	0.38	0.43	0.45	0.46	0.40	

** Significant at 1 percent, * significant at 5 percent NS - Non Significant

NUTRITIONAL EVALUATION OF BASIC AND VALUE ADDED INSTANT DALIYA MIX

Four variations of value added instant *daliya* mix were formulated in the experiment and best accepted variation with selected basic was evaluated for nutrient composition. Results (Table 5) evidenced that moisture content of basic and value added instant *daliya* mix was 7.25 per cent and 7.73 per cent. The moisture content recorded for both mixes was at par. Value added instant *daliya* mix recorded highest protein 16.19 per cent and it was significantly more than basic mix 6.45 per cent. Fat content of basic and value added instant *daliya* mix was 0.61 per cent & 2.22 per cent respectively. The results indicated that protein and fat content of value added instant *daliya* mix was increased significantly at 1 per cent level of significance.

Total minerals content of basic and value added instant *daliya* mix was 0.78 per cent & 2.38 per cent

respectively. Fiber content of basic mix was 0.58 per cent & value added instant *daliya* mix recorded 1.62 per cent. It can be noticed that the fiber and mineral content of the value added instant *daliya* mix was significantly more than the basic *daliya* mix at 1 per cent level of significance due to the value addition of nutritious ingredients.

The carbohydrate content of the basic *daliya* mix contained 84.41 per cent & value added *daliya* mix recorded 69.85 per cent. The carbohydrate content of value added *daliya* mix exhibited significant decrease ($P < 0.01$) by 14.56g. Energy content of the basic & value added *daliya* mix was found to be 369 K.cal & 364 K.cal respectively. Data indicated significant decrease ($P < 0.01$) in energy content of value added *daliya* mix.

The calcium, phosphorus, iron, zinc, copper, manganese, β carotene & vitamin „C” content of

basic and value added instant *daliya* mix was 22mg & 196mg; 160mg & 335mg; 2.83mg & 6.93mg; 0.33mg & 2.27mg; 0.20mg & 1.17mg; 0.14mg & 2.75mg; 57µg & 386µg and 0.0mg & 3.86mg per 100g mix respectively. In-vitro protein digestibility & iron bioavailability of basic *daliya* mix was 52.36 per cent & 28.86 per cent and value added *daliya* mix was

65.60 per cent & 54.73 per cent respectively. A decrease in carbohydrate content was observed in value added instant *daliya* mix that is due to increase in proximate content of value added instant *daliya* mix. The addition of niger seed enhanced hidden fat in the value added instant *daliya* mix.

Table 4. Sensory evaluation scores of value added instant *daliya* mix

Variation	Colour	Texture	Taste	Flavour	Overall acceptability	Total
Basic	4.40	4.45	4.50	4.45	4.50	22.3
A	4.10	4.05	3.65	3.65	3.50	18.95
B	3.55	3.40	3.05	3.50	3.65	17.15
C	4.60	4.55	4.60	4.70	4.55	23.0
D	4.15	4.05	4.15	4.15	4.20	20.7
Mean	4.16	4.10	3.99	4.09	4.08	20.42
F value	6.94**	8.73**	17.16**	16.10**	10.88**	
SE±	0.15	0.15	0.15	0.16	0.14	
CD	0.41	0.42	0.42	0.44	0.40	

** Significant at 1 percent level, * significant at 5 percent level, NS - Non Significant

NUTRITIONAL EVALUATION OF BASIC AND VALUE ADDED DALIYA

The best accepted variation of *daliya* prepared from value added instant *daliya* mix and basic mix were evaluated for nutrient composition. Table 6 shows the nutrient composition of the basic and value added instant *daliya*. Results evidenced that moisture content of basic and value added instant *daliya* was 64.06 per cent and 65.19 per cent. The statistical non significant difference was noticed with moisture content. Value added instant *daliya* recorded protein 16.13 per cent and it was significantly more than basic *daliya* 6.45 per cent. Fat content of basic and value added instant *daliya* was 15.52 per cent & 2.55 per cent respectively. The results indicate that fat content of basic *daliya* was significantly more than value added *daliya* (P<0.01).

Total minerals content of basic and value added *daliya* was 0.95 per cent & 2.63 per cent respectively. Fiber content of basic *daliya* was 0.51 per cent & value added instant *daliya* recorded 1.60 per cent. It can be noticed that the value obtained for fiber and mineral content of the value added instant *daliya* was significantly more due to the value addition of nutritious ingredients.

The carbohydrate content of the basic *daliya* was 69.22 per cent & value added *daliya* recorded 69.36 per cent. The carbohydrate content of basic & value added *daliya* exhibited a non significant difference. Energy content of the basic & value added *daliya* was 443K.cal & 366K.cal. Statistical data indicated that energy content of value added *daliya* decreased significantly (P<0.01) than basic product.

The calcium, phosphorus, iron, zinc, copper, manganese, β carotene & vitamin „C“ content of basic and value added instant *daliya* was 48mg & 213mg; 172mg & 354mg; 3.58mg & 7.34mg; 0.28mg & 2.05mg; 0.16mg & 1.15mg; 0.1mg & 2.63mg; 146µg & 386µg

and 0.0mg & 3.33mg per 100g of *daliya* respectively. In-vitro protein digestibility & iron bioavailability of basic *daliya* was 58.15 per cent & 27.14 per cent and value added *daliya* was 83.49 per cent & 56.66 per cent respectively.

SHELF LIFE STUDY OF DEVELOPED FORTIFIED INSTANT DALIYA MIX

The effect of storage on sensory parameters of formulated instant *daliya* mix (Table 7) showed that the colour, texture and taste of the products was not changed after storage of six months in both the packaging pouches. On the contrary flavour component of the *daliya* from both pouches and overall acceptability from laminated aluminium pouch were significantly reduced after 180 days. Even from P2 pouch scores for flavour were decreased significantly. The effect of packaging material on sensory parameters of formulated instant *daliya* mix revealed that scores for all parameters were at par. Hence, it can be concluded that *daliya* mix can be packed successfully in both packaging materials for six months.

Effect of storage on chemical parameters of formulated instant *daliya* mix is presented in Table 8. The data revealed that moisture content of instant *daliya* mix had an initial value of 7.73 per cent which was increased gradually up to 8.98 for P1 packed *daliya* mix and 8.58 for P2 packed *daliya* mix at the end of the storage period. Results indicated that the significant increase in moisture content of the developed instant *daliya* mix was observed during storage in both the packaging materials.

The effect of packaging material on peroxide value indicated that there was significant increase at 1 per cent level in peroxide value of formulated value added instant *daliya* mix which was stored in polythene pouch over the mix which was stored in laminated aluminium pouch. The peroxide value of the product at

the end of the storage period found to be increased from initial 0.43meq/kg to 0.53meq/kg for P1 and to 0.47meq/kg for P2 packaging material used for storage.

The statistical analysis revealed that there was increase in peroxide value during storage of developed instant *daliya* mix was significant at 5 per cent level.

Table 5. Nutrient composition of formulated *daliya* mixes

Nutrients	Basic mix (Mean±SD)	Value added mix (Mean±SD)	Increase / Decrease	't' value Basic vs Value added
Moisture (g)	7.25±0.23	7.73±0.35	+0.48	1.93NS
Protein (g)	6.45±0.25	16.19±1.38	+9.74	11.88**
Fat (g)	0.61±0.14	2.22±0.05	+1.61	28.37**
Total minerals (g)	0.78±0.06	2.38±0.10	+1.6	22.93**
Fiber (g)	0.58±0.06	1.62±0.29	+1.24	6.47**
Calcium (mg)	22±2.20	196±6.34	+174	44.95**
Phosphorus (mg)	160±8.03	335±8.16	+175	26.48**
Iron (mg)	2.83±0.11	6.93±0.23	+4.1	27.50**
Zinc (mg)	0.33±0.24	2.27±0.19	+1.95	9.61**
Copper (mg)	0.20±0.03	1.17±0.03	+0.97	36.21**
Manganese (mg)	0.14±0.04	2.75±0.07	+2.52	54.79**
Vitamin „C“(mg)	-	3.86±0.11	+3.86	-
β carotene (µg)	57±4.00	386±4.07	+328	99.61**
Protein Digestibility (%)	52.36±1.23	65.59±1.18	+13.23	13.79**
Iron Bioavailability (%)	28.86±1.09	54.73±1.22	+25.87	27.38**
Calculated values				
Carbohydrate (g)	84.41±0.21	69.85±1.07	+14.56	23.12**
Energy (k.cal)	369±0.92	364±0.39	-5	9.17**
Vitamin B1 (mg)	0.24	2.53	+2.29	-
Vitamin B2 (mg)	0.09	0.57	+0.48	-
Niacin (mg)	2.74	3.32	+0.49	-

** Significant at 1 percent level

* significant at 5 percent level

NS - Non Significant

The results indicated that the initial reducing sugar content of the value added 5 per cent level mix was 0.31g/100g which was increased up to 0.64g/100g for P1 packaging material and up to 0.57g/100g for P2 packaging material on 180th day of storage. Statistically significant increase in reducing sugar at 1 per cent level of significance was observed on storage of *daliya* mix in both packaging materials. Initially the non reducing sugar content of formulated instant *daliya* mix was 10.69g/100g which was reduced up to 10.13g and 10.25 during storage in P1 and P2 packaging materials respectively. The reduction in the non reducing sugar during storage was statistically non significant for both the P1 and for P2 packed *daliya* mixes.

Initially the developed *daliya* mix had total sugar 11.06g/100g and at the end of the storage period the total sugar content was 10.77g/100g for P1 and 10.83g/100g for P2 stored *daliya* mix. A decrease in the amount of total sugar during storage of formulated instant *daliya* mix was observed but the reduction was not significant.

The microbial population of instant *daliya* mix stored in different packaging materials i.e. in polythene pouch (P1) and laminated aluminium pouch (P2) is given in Table 9. Initially the microbial population of developed

instant *daliya* mix was found to be nil or below the detectable level. However, it was increased up to 6×10^{-2} cfu/g for *daliya* mix packed in polythene pouch and 5×10^{-2} cfu/g for the mix packed in laminated aluminium pouch at the end of the storage period. Both the packed samples had low microbial population and hence were fit for consumption after storage.

It is clear from the storage study that moisture content of instant *daliya* mix packed in both packaging materials increased significantly with increase in storage period. Peroxide value of stored instant *daliya* mix in both packaging materials was increased significantly at the end of six months storage. Increase in reducing sugar content and decreasing trend in total sugar content during storage was observed but the decrease was not significant.

Less increase in microbial population up to six months storage of formulated instant *daliya* mix was observed in both packaging materials. These results are in line with the observations obtained by Surekha (2012) study reported that value added products prepared from barnyard millet were stored well up to two months without much microbial growth on storage. In the present investigation the microbial load of developed fortified instant *daliya* mix was within the BIS specification.

Table 6. Nutrient composition of prepared *daliya*

Nutrients	Basic <i>daliya</i> (Mean±SD)	Value added <i>daliya</i> (Mean±SD)	Increase / Decrease	't' value Basic vs Value added
Moisture (g)	64.06±1.74	65.19±1.37	+1.13	0.88 ^{NS}
Protein (g)	6.45±0.25	16.13±1.38	+9.68	11.88**
Fat (g)	15.62±0.26	2.55±0.11	-13.07	78.97**
Total minerals (g)	0.95±0.06	2.63±0.05	+1.68	33.84**
Fiber (g)	0.51±0.01	1.60±0.03	+1.09	57.50**
Calcium (mg)	48±2.36	213±7.18	+164	37.73**
Phosphorus (mg)	172±8.95	354±8.34	+182	26.29**
Iron (mg)	3.58±0.21	7.34±0.24	+3.76	20.36**
Zinc (mg)	0.28±0.04	2.05±0.29	+1.77	11.56**
Copper (mg)	0.16±0.04	1.15±0.07	+0.99	20.13**
Manganese (mg)	0.1±0.01	2.63±0.27	+2.62	15.85**
Vitamin „C”(mg)	-	3.33±0.09	+3.33	-
β carotene (μg)	146±2.12	386±4.87	+240	78.20**
Protein Digestibility (%)	58.15±3.14	83.49±4.67	+25.34	7.67**
Iron Bioavailability (%)	27.14±1.21	56.66±1.04	+29.52	32.04**
Calculated values				
Carbohydrate (g)	69.22±1.41	69.36±2.71	-0.14	0.07 ^{NS}
Energy (k.cal)	443±7.95	366±5.80	-77	13.58**
Vitamin B1 (mg)	0.24	2.53	+2.29	-
Vitamin B2 (mg)	0.09	0.57	+0.48	-
Niacin (mg)	2.74	3.32	+0.49	-

** Significant at 1 percent level, * significant at 5 percent level, NS - Non Significant

Table 7. Effect of storage and packaging material on sensory parameters of formulated value added instant *daliya*

Parameters	Polythene pouch (P1)		't' value	Laminated aluminium pouch (P2)		't' value	(P1) Vs (P2) 180th day 't' value
	First day (Mean±SD)	180th day (Mean±SD)		First day (Mean±SD)	180th day (Mean±SD)		
Colour	4.60±0.59	4.30±0.80	1.34NS	4.60±0.59	4.40±0.59	1.07NS	0.44NS
Texture	4.55±0.59	4.20±0.69	1.72NS	4.55±0.59	4.40±0.59	0.80NS	0.98NS
Taste	4.60±0.68	4.10±0.85	2.05NS	4.60±0.68	4.20±0.69	1.84NS	0.40NS
Flavour	4.70±0.60	4.0±0.72	3.34**	4.70±0.60	4.20±0.61	2.61*	0.94NS
Overall acceptability	4.55±0.47	4.0±0.72	2.86**	4.55±0.47	4.30±0.57	1.51NS	1.46NS

** Significant at 1 percent, * significant at 5 percent, NS - Non Significant

SUMMARY AND CONCLUSION

Value addition or food fortification is most cost effective and sustainable strategy to address the problem of micronutrient malnutrition. The value addition of papaya, skimmed milk powder & niger seed improved acceptability of instant *daliya* mix. value addition not only helped to increase protein, total mineral, fiber, calcium, phosphorus, iron, zinc, β carotene & vitamin „C” content of mix but also improved in vitro protein digestibility and iron

bioavailability. Storage study indicated that instant *daliya* mix can be stored up to six months. After storage of six months the mixes were found to be acceptable. Moisture absorption and peroxide value was low in laminated aluminium pouch (P1) than polythene pouch (P2) stored mix. Microbial study showed that both the stored samples had safe microbial population and hence were fit for consumption at the end of storage period.

Table 8. Effect of storage and packaging material on chemical parameters of value added instant *daliya mix*

Parameters	Storage packaging material		't' value
	Polythene pouch (P1) (Mean±SD)	Laminated aluminium pouch (P2) (Mean±SD)	
Moisture (g)			
Initial	7.73±0.35	7.73±0.35	NS
Final	8.98±0.29	8.58±0.24	1.84NS
't' value	4.76*	3.46*	
Peroxide value (meq/kg)			
Initial	0.43±0.01	0.43±0.01	NS
Final	0.53±0.005	0.47±0.01	6.57**
't' value	15.49**	3.84*	
Reducing sugar (g/100g)			
Initial	0.31±0.03	0.31±0.03	NS
Final	0.64±0.04	0.57±0.01	2.83NS
't' value	10.75**	11.82**	
Non reducing sugar (g/100g)			
Initial	10.69±1.24	10.69±1.24	NS
Final	10.13±1.28	10.25±0.01	0.11NS
't' value	0.54NS	0.42NS	
Total Sugar (g/100g)			
Initial	11.06±1.25	11.06±1.25	NS
Final	10.77±1.24	10.83±1.25	0.17NS
't' value	0.23NS	0.05NS	

** Significant at 1 percent, * significant at 5 percent NS - Non Significant

Table 9- Effect of storage on total bacterial count of value added instant *daliya mixes*

Days of storage	Polythene pouch	Laminated aluminium
Initial (1st day)	BDL	BDL
Final (180th day)	6×10 ⁻²	5×10 ⁻²

BDL – Below detectable level

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