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Development Of Instant Soup Mix Incorporated With Chia Seeds (Sweet) And Butterfly Pea Flower (Clitoria Terntea)

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ABSTRACT

The present study was conducted to Development of instant soup mix that incorporates chia seeds (sweet) and butterfly pea flower (Clitoria Terntea). Formulations of soup mix containing S1(5:0:47:38 :10), S2(0:5:47:38 :10), S3(1:5:46:38 :10), S4(2:4:46:38 :10), S5(3:3:46:38 :10), S6(4:2:46:38 :10), S7(5:1:46:38 :10) with butterfly pea flower (Clitoria Terntea), chia seeds (sweet), corn flour, spice powder and dehydrated vegetables. The product samples were evaluated for sensory evaluation proximate analysis and shelf life. when the sensory evaluation was conducted with 17 members the S5(3:3:46:38 :10) sample got the higher sensory score among all samples. This sample contains Moisture 8.74%, Ash 9.77%, Fat 2.42%, protein 12.45%, crudefiber 5.11%, carbohydrate 61.72%, Energy 335.804. Instant soup, mix did not reveal any pathogenic organism where it stands for 97 days in laminated LDPE pouch under normal room conditions.

Key Words: butterfly pea flower, chia seeds, instant soup mix.

CHAPTER-1

Introduction

Due to urbanization most People consume what is available or food that requires less preparation time without considering the health benefits derived from the food they consume. Hence an attempt is made to prepare a soup that requires less time for preparation without compensating for the health benefits Instant soups play an important role in balancing the nutrients required for people to stay healthy. (Sudarsan et al., 2017).

Dehydrated food especially dry soup mixes have major advantages such as protection from oxidative spoilage, and enzymatic spoilage and can have flavor stability for longer periods up to 1 year at room temperature. They are a rich source of protein and have good nutritive value and they have longer life without refrigeration. Due to their lesser weight, they are easy to ship and can be readily available around the clock in the year Functional soup can become an alternative food for breakfast because it could fulfill the adequacy of energy and nutrient required by the body, very practical in preparation and taking an only short time to serve. Supplemented additives and their functional attributes and their ratio are major concerns for good quality dried soups for maintaining nutritive value wholly, legumes and vegetables are added in it. Due to these needed carbohydrates, proteins, fiber, and amino acids are provided. Soup powders and their functional attributes provide health benefits Due to the limitation of plant proteins deficiency of amino acids, can be maintained or fulfilled by mixing legume and vegetable flours together(Upadhyay et al., n.d.)

Any dehydrated soup mix should be rehydratable and cookable within a minimum time period and should be as nutritious and palatable as canned and frozen products. in comparison to freshly prepared soup, the instant dry soup should also possess dried quality, representing the dominant flavor and aroma of the ingredients used. it is desirable that the product be free from off flavors, off-taste, unacceptable aroma, and of the essential requirements.(Ansari et al., 2021) In the modern world commercially, prepared instant soup has replaced homemade soup as preparing a soup is a time-consuming process. The working persons consume foods that require less preparation time without considering the health benefits. Instant soups play an important role in balancing the nutrients required for people to stay healthy and can become an alternative food for breakfast.

Currently, the development of the Butterfly pea flower (Clitoria Terntea) has not been widely carried out because many people do not know the benefits of the Butterfly pea flower. The utilization of the Butterfly pea flower in the food sector has been carried out in several countries. The blue color of the Butterfly pea flower has been used as a blue dye in sticky rice in Malaysia. It is also usually eaten as a vegetable in Kerala (India) and in the Philippines . Lately, Butterfly pea flowers are also being consumed by many people around the world because of the trend via social media in the UK as Butterfly Pea Tea .

Butterfly pea flower contains a lot of active ingredients that have pharmacological potential widely, including an antioxidant, antimicrobial, antidiabetic, and anticancer . The butterfly pea is a plant native to Asia that is known for its bright blue flowers. It's rich in antioxidants and often used as an herbal tea and natural dye.(Patindol, 2022)

These flowers are rich in antioxidants, including terrains, Kaempferol p-coumaric acid, and delphinidin-3,5-glucoside. Kaempferol compound has been extensively for its cancer-fighting properties. Test-tube studies indicate that it may kill off cancer cells. p-Coumaric acid some research suggests that p-Coumaric acid could have anti-inflammatory, antimicrobial, and antiviral effects, Which may help protect against disease. Delphinidin -3,5-glucoside according to one study, this antioxidant may help stimulate immune function and cause cell death in colorectal cancer cells. This pea flower has many health benefits that are Supports skin and hair health, may promote weight loss, and Stabilizes blood sugar levels. In the soup mix, a dry Powdered

butterfly pea flower is used.

The consumption of chia seed has increased in recent years due to its high content of omega-3 fatty acids and dietary fiber. This seed also has a high concentration of proteins and essential amino acids, becoming a promising source of bioactive peptides.(Shobha et al., 2019) The objective of this review was to identify the composition and the beneficial effects of chia seeds, their proteins, peptides, and their potential impact on human health. (Grancieri et al., 2019).

The Uniport's database was used to identify the chia proteins and their amino acid sequences. The BIOPEP database was used to analyses the peptide's bioactive potential. A total of 20 proteins were catalogued in chia seed, 12 of those were involved in the regular metabolic processes of the plant cells. However, eight proteins were specifically related to the production and storage of plant lipids, thus explaining the high concentration of lipids in chia seeds (around 30%), especially omega-3 fatty acids (around 20%). The analyses of amino acid sequences showed peptides with bioactive potential, including dipeptidyl peptidase-IV inhibitors, angiotensin-converting enzyme inhibitors, and antioxidant capacity.

These results correlated with the main health benefits of whole chia seed in humans such as antioxidant capacity, and hypotensive, hypoglycemic, and anticholesterolemic effects. Such relation can be associated with chia protein and peptide compositions and therefore needs furtherinvestigation in vitro and in vivo.

In this soup present usage of ingredients are very nutritional and have the good structural methods, like onion powder, ginger powder, garlic powder, corn starch, and Dehydrated Vegetables (carrot, green pea) ingredients which need to be incorporated to get the best soup mixof desired health benefits and without compromising on taste, odorants, and their sensorial property

CHAPTER-2
Materials and methods

2.1 Procurement of Raw material:

The raw materials required for the preparation of instant soup mix are onion, ginger, garlic, coriander, chia seeds (sweet), carrot, capsicum, cinnamon, black pepper, green peas, salt, chili flakes, cumin, corn flour, sugar procured from the local market of Kakinada. butterfly pea floweris procured from the villages.

2.2 Preparation of ingredients:

2.2.1 Preparation of onion powder:

Clean the onion and cut it into small pieces and then dry by using the tray dryer with a temperature of 70° C for 6 hours, followed by blending & sieving, and stored in LDPE pouches.The process is shown in process flow chart 2.1.1

2.2.2 Preparation of garlic powder:

the garlic and blend the garlic coarsely and then dry it by using the tray dryer with a temperature of 70° C for 6 hours, followed by blending & sieving and storing in LDPE pouches. The process is shown in process flow

chart 2.1.2.

2.2.3 Preparation of ginger powder:

Clean the ginger, blend the ginger coarsely, and then dry or dehydrate it by using the tray dryer with a temperature of 70° C for 6 hours Followed by blending & sieving and storing it in LDPE pouches. The process is shown in process flow chart 2.1.3.

2.2.4 Preparation of Spice powder:

Followed by blending & sieving take the spice proportion of Cinnamon, cumin, and Black pepper in 40:20:40 proportion and roast until getting a good aroma, leave it for some time to get cool. And then grind the powder finely and sieve it and stored in LDPE pouches. The process is shown in process flow chart 2.1.4.

2.2.5 Preparation of chili flakes:

Chilies are roasted for some time until to get a light brown color, leave it for some time to cool, and then grind it coarsely. These chili flakes are stored in LDPE pouches. The process is shown in process flow chart 2.1.5.

2.2.6 Preparation of coriander powder:

Coriander is clean it with 50PPM chlorine water, leave it for some time to drain out the excesswater, then dry it by using the tray dryer with a temperature of 70° C for 2 hours, followed by blending & sieving and stored it in LDPE pouches. The process is shown in process flow chart2.1.6.

2.2.7 Preparation of curry leaf powder:

Curry Leaf is clean it with 50PPM chlorine water, leave it for some time to drain out the excess water, then dry or dehydrate it by using the tray dryer with a temperature of 70° C for 2 hours, followed by blending & sieving and stored it in LDPE pouches. The process is shown in process flow chart 2.1.7.

2.2.8 Preparation of Dehydrated carrot:

carrot is clean it with 50PPM chlorine water, and leave it for some time to drain out the excess water. These carrots were blanched and maintained at the temperature of 80-100° C for 4 minutes, leave it for some time to cool and cut into small pieces, and then dehydrated by using the tray dryer with a temperature of 70° C for 6 hours then stored in LDPE pouches. The processis shown in process flow chart 2.1.8.

2.2.9 Preparation of Dehydrated green pea:

Green pea is clean it with 50PPM chlorine water, and leave it for some time to drain out the excess water. These were blanched and maintained at the temperature of 80-100° C for 4 minutes, leave it for some time to cool and cut into small pieces, and then dehydrated by using the tray dryer with a temperature of 70° C for 6 hours, then stored in LDPE pouches. The process is shown in process flow chart 2.1.9.

2.2.10 Preparation of butterfly pea flower powder:

Butterfly pea flower is cleaned from any dirt and green leaves then dry or dehydrated by using the tray dryer with a temperature of 70° C for 2 hours Followed by blending & sieving, and stored in LDPE pouches. The process is shown in process flow chart 2.1.10.

2.2.11 Preparation of Chia seeds (Sweet) powder:

Chia seeds (Sweet) are clean from any dirt and dust then dry or dehydrated by using the tray dryer with a temperature of 70° C for 30 minutes, then blended and sieve, and stored in LDPE pouches. The process is

shown in process flow chart 2.1.11.

2.2.12 Preparation of Dehydrated capsicum:

Capsicum is clean with 50PPM chlorine water, and leave it for some time to drain out the excess water., cut it into small pieces, and then dry or dehydrate by using the tray dryer with a temperature of 70° C for 6 hours, then stored in LDPE pouches. The process is shown in process flow chart 2.2.12.

Table 2.1: Blanching time and temperatures

S.no	Ingredients	Blanching medium	Blanching time	Blanching Temperature
1	Carrot	Water	4	80-100° C
2	Green Pea	Water	4	80-100° C
3	Ginger	Water	4	80-100° C

Table 2.2: Tray drying time and temperature

S.no	Ingredients	Drying temperature	Drying time
1	Onion	70° C	6 hours
2	Ginger	70° C	6 hours
3	Garlic	70° C	6 hours
4	Carrot	70° C	6 hours
5	Green pea	70° C	6 hours
6	Capsicum	70° C	6 hours
7	Coriander leaves	70° C	2 hours
8	Curry leaves	70° C	2 hours
9	Butterfly pea flower	70° C	2hours

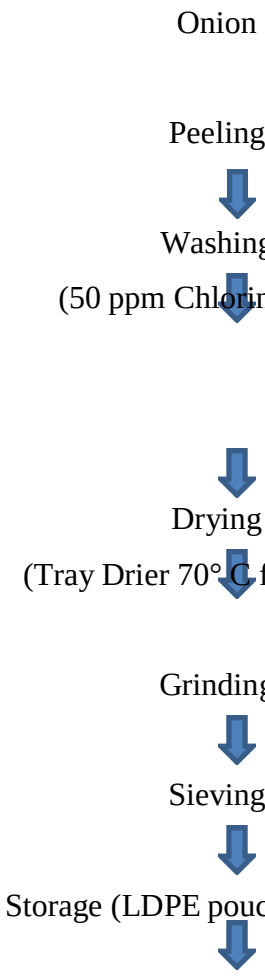

Figure 2.1.1
Flow sheet for the preparationof onion powder

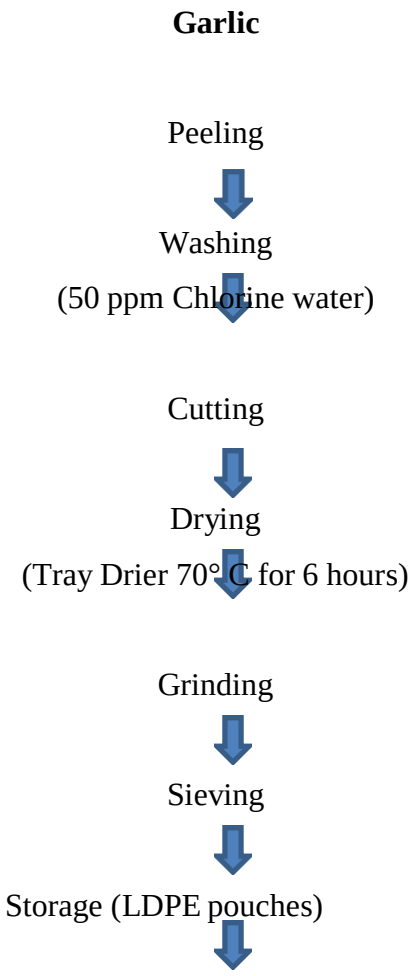

Figure 2.1.2
Flow sheet for the preparationof garlic powder

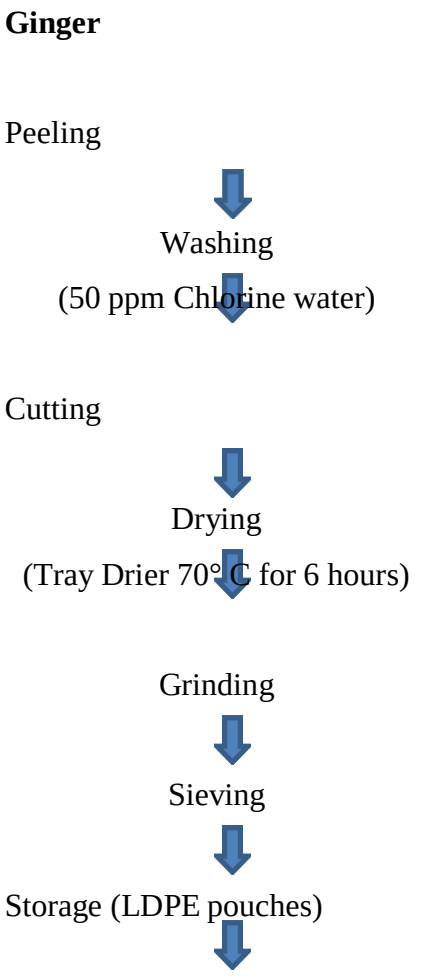

Figure 2.1.3
Flow sheet for the preparationof ginger powder

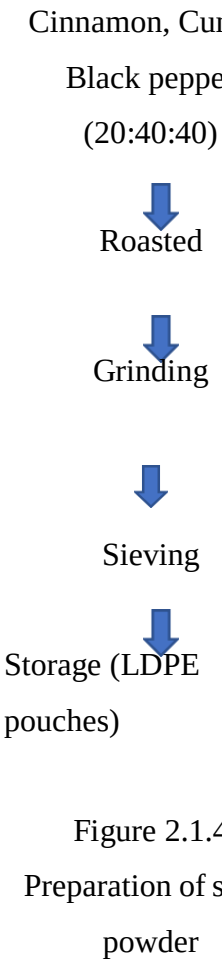

Figure 2.1.4 Preparation of spice powder

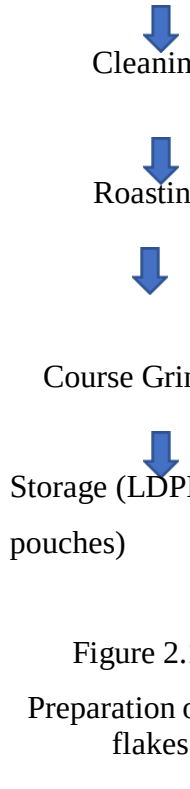

Figure 2.1.5 Preparation of chili flakes

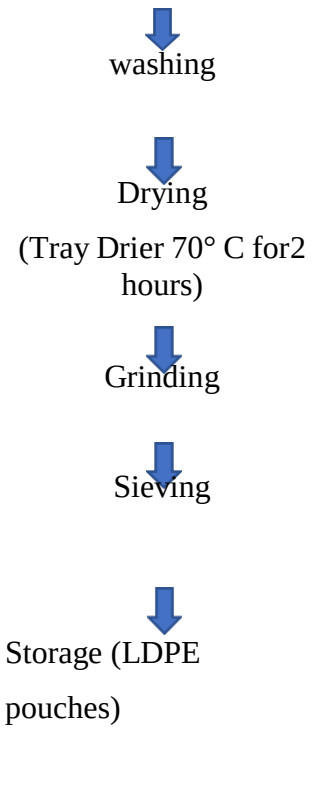

Figure 2.1.6 Preparation of coriander leaf powder

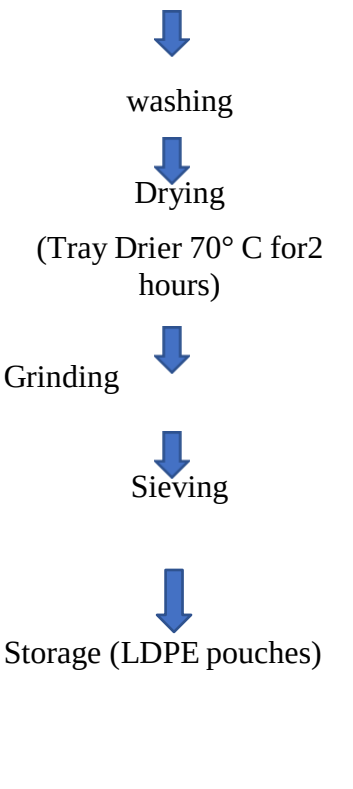

Figure 2.1.7 Preparation of curry leaf powder

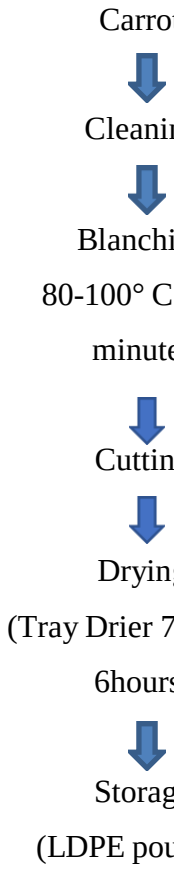

Figure 2.1.8 preparation of dehydrated carrot

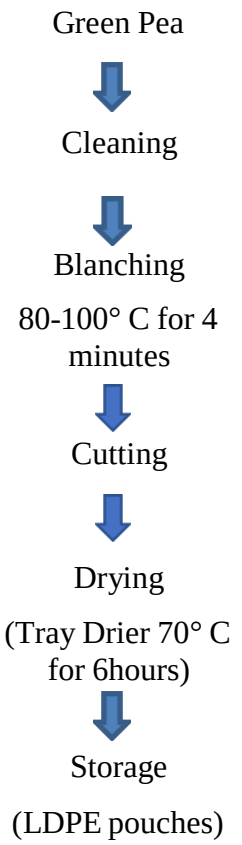

Figure 2.1.9 preparation of dehydrated Green Pea

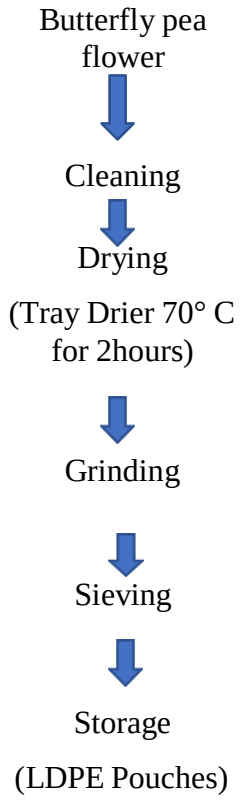

Figure 2.1.10 Preparation of Butterfly pea flower powder

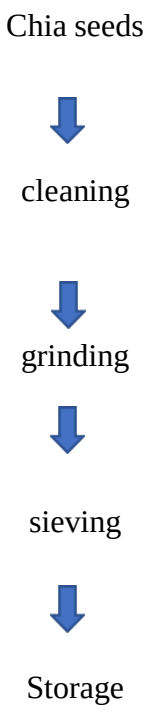

Figure 2.1.11 Preparation of chia powder

Capsicum

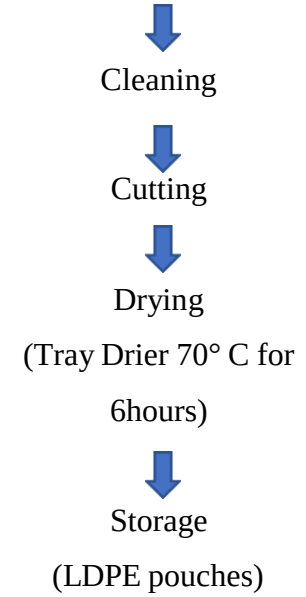

Figure 2.1.12 preparation of dehydrated capsicum

2.3 Preparations of samples :

Different proportions were shown below

S.No	Ingredients	C (g)	S_1	S_2	S_3	S_4	S_5	S_6	S_7
1	Butterfly pea flower	-	0	5	1	2	3	4	5
2	Chia Seed Powder	-	5	0	5	4	3	2	1
3	Cornflour	52	47	47	46	46	46	46	46
4	Ginger Powder	4	4	4	4	4	4	4	4
5	Garlic Powder	3	3	3	3	3	3	3	3
6	Onion Powder	10	10	10	10	10	10	10	10
7	Salt	4	4	4	4	4	4	4	4
8	Sugar	3	3	3	3	3	3	3	3
9	Chilli flakes	2	2	2	2	2	2	2	2
10	Spice Powder	6	6	6	6	6	6	6	6
11	Coriander Powder	3	3	3	3	3	3	3	3
12	Curry leaves Powder	3	3	3	3	3	3	3	3
13	Dehydrated vegetables	10	10	10	10	10	10	10	10
	Total	100g	100g	100g	100g	100g	100g	100g	100g

Figure 2.2 different soup samples

2.4 Preparation of instant soup mix:

Weigh all the ingredients as per composition

↓

Mix thoroughly

↓

Stored (LDPE Pouches)

Figure 2.2.1 Preparation of instant soup mix

2.5 Cooking of Instant soup:

Take 500ml of hot water and mix 50g of instant soup powder into it. cook the mixture on a low flame for about 3-5 min continuous stirring until the Brix reaches up to 15°, and the finalproduct is obtained.

Figure 2.3 different soup samples after preparation

2.6 Equipment For conducting proximate analysis following equipment are used.

1. Hot air oven
2. Muffle furnace
3. Soxhlet apparatus
4. Micro-kjeldhal apparatus
5. Muffle furnace
6. Glassware
7. Centrifuge
8. Hygrometer

2.6.1 Chemicals and reagents

1. 2.5N HCl
2. 3. Petroleum ether

2.6.2 Bio Chemical Properties of Soup:

2.6.2.1 Total Soluble Solids (°B)

The percentage of total soluble solids is determined by using digital refractometer by placing a drop of powdered liquid solution on the prism of the refractometer and observing the coincidence of the shadow of the sample with the reading on the scale and expressed as ° Brix.

2.6.2.2 Moisture Content

Moisture content is estimated using air oven drying method by placing about 2-5 g of sample for 24 h in a hot air oven (Model KOMA 3) maintained at 103 + 1°C (FSSAI, 2012).

Figure :2.6.1 Hot air oven

Procedure:

i. Dry the empty dish and lid in the oven at 105°C for 3 hours and transfer to desiccatorto cool. Weigh the empty dish and lid (W_1).

ii. Weigh about 2-5 g of sample to the dish. Spread the sample to the uniformity. Closethe lids tightly and note their weights (W_2).

iii. Place the dish with sample in the oven with the lids open. Dry for 24 hours at 103 +1°C.

iv. After drying, transfer the dish with partially covered lid to the desiccator to cool.

v. Reweigh the dish and its dried sample i.e., the bone-dry material (W_3).

vi. Moisture content on wet basis (w.b.) is calculated as mentioned.

Calculation:

Moisture content (%) = $((\mathbf{W}_2 - \mathbf{W}_3) / (\mathbf{W}_2 - \mathbf{W}_1)) \times 100$Where, W_1 = Weight of the empty box (g)

W_2 = weight of the box + weight of the sample (g)

W_3 = weight of the box + weight of the bone - dry mater

2.6.2.3 Fat

The fat content of the sample is determined by semi-continuous soxhlet method using soxhlet apparatus (Model SCS 4). Plate

Soxhlet Apparatus Principle: Non polar solvent is continuously volatized, condensed and then allowed to pass through the sample to extract solvent soluble materials. When the process is complete the solvent is distilled, collected in another container, and made to dry letting only the crude fat to remain, weighed and the percentage is calculated.

Reagents: Petroleum Ether

Figure 2.6.2 Soxhlet Apparatus

Procedure:

i. Weigh 2-5 g of moisture free sample and take it into a cellulose thimble.

ii. Cover the top of the thimble with cotton and place it in the soxhlet beaker of knownweight.

iii. Pour 80 ml of petroleum ether into the beaker.

iv. Place the beaker in the soxhlet apparatus.

v. Arrange the outlet and inlet pipes.

vi. Switch on the soxhlet apparatus and set the temperature to 80 °C.

vii. Leave it for an hour. The petroleum ether extracts the fat from the sample.

viii. After an hour increase the temperature to 160 °C for separation of petroleum ether bydistillation process

ix. Switch off the apparatus and remove the beakers.

x. Place the beaker on a hot plate (or) hot air oven at 100 °C for 10 minutes for the removal of any residues of petroleum ether.

xi. Take the weight of the beaker and again place it on the hot plate (or) hot air oven. Repeat the process till the two consecutive weights of the beaker are equal. xii. Notethe final weight of the beaker and calculate the fat content.

Calculation:

Fat content (%) = (Final weight of the beaker) − (Weight of the empty beaker) Weight of the sample × 100 3.4.4

2.6.2.4 Crude Protein :

Crude protein of the sample is estimated using micro-kjeldhal method.

Principle: The nitrogen in protein or other organic material is converted to ammonium sulphate $(NH)_2SO_4$ by H_2SO_4 during digestion. This salt on steam distillation liberates ammonia, which is collected in boric acid solution and titrated against standard acid (0.1 N H2SO4 or HCl) since 1 ml of 0.1 N acid is equivalent to 1.401 mg of nitrogen.

Reagents:

Digestion Mixture: Mix copper sulphate and potassium sulphate in the ratio 1:5 and grind well using mortar and pestle. Concentrated sulphuric acid 98% reagent grade 4% Boric Acid Methyl red Indicator and Bromocresol green indicator40% NaOH, 0.1 N Hydrochloric acid Plate . Digestion Unit (Model KES 121) Plate Distillation Unit (Model ELITE EX)

Figure 2.6.3 Digestion Unit Plate	Figure 2.6.4 Distillation Unit

Procedure:

i. Weigh 0.2 - 0.5 g of sample into the digestion flask and add 5 g of digestion mixture.

ii. Add 10 mL of concentrated sulphuric acid to it.

iii. Keep it for digestion at 380°C for 1 hour.

iv. Cool the digested tubes and add 20 mL of distilled water in each tube. 12

v. Set the inlet and outlet tubes to the distillation unit for cooling and release the tap.

vi. Keep the digestion tube on the left side chamber of distillation unit.

vii. Take 20 mL of 4% boric acid into a conical flask. Add 3 drops of methyl red indicator and 1 drop of bromocresol green indicator and place it in the right-side chamber of the distillation unit.

viii. Place the alkali tube into the beaker containing 40% sodium hydroxide.

ix. Set the alkali run button to 10 seconds and distillation time for 9 minutes.

x. Press the alkali run button for 4 times to release the alkali into the digestion tube

xi. After releasing alkali, the contents in the tube turns to black color. Press the distillation run button.

xii. The distillation occurs and nitrogen is released into the conical flask containing 4% boric acid and turns the pink coloured boric acid to colourless.

xiii. The neutralization is done by titrating the contents in the conical flask with 0.1 NHCl.

xiv. Blank is set with distilled water.

xv. Note the titration readings and calculate the % nitrogen and % protein.

Calculation:

Nitrogen % = (ml HCl – ml Blank) x Normality x 14.01 x 100 Weight of the sample x 1000Protein % = Nitrogen x 6.25 (protein factor)

2.6.2.5 Crude Fiber

Crude fiber is estimated using AOAC Official Method 2005.

Principle: During the acid and subsequent alkali treatment, oxidative hydrolytic degradation of the native cellulose and considerable degradation of lignin occur. The residue obtained after final filtration is weighed, incinerated, cooled and weighed again. The loss in weigh gives the crude fiber content.

Reagents: Sulphuric Acid solution (0.225 + 0.005 N): 1.25g concentrated sulphuric acid diluted to 100 mL (concentration must be checked through titration). Sodium Hydroxide solution (0.313 + 0.005 N): 1.25g sodium hydroxide in 100 mL distilled water (concentration must be checked by titration with standard acid).

Procedure:

i. Extract 2g of ground material with ether or petroleum ether to remove fat (initial boiling temperature 35-38 °C and final temperature 52 °C). If the fat content is below 1%

ii. fat extraction may be omitted.

iii. After extraction with ether boil 2 g of dried material with 200 mL of sulphuric acid for30 min with bumping chips.

iv. Filter through muslin and wash with boiling water until washings are no longer acidic.

v. Boil with 200 mL of sodium hydroxide solution for 30 min.

vi. Filter through muslin cloth again and wash with 25 mL of boiling 1.25% H_2SO_4, three 50ml portions 13 of water and 25 mL alcohol.

vii. Remove the residue and transfer to ashing dish (pre weighed dish W_1).

viii. Dry the residue for 2 h at 130 + 2°C. Cool the dish in a desiccator and weigh (W_2)

ix. . Ignite for 30 min at 600 + 15°C

x. . Cool in a desiccator and reweigh (W_3).

Calculation:

Crude fiber in ground sample (%) = Loss in weight on ignition $(W_2 - W_1) - (W_3 - W_1)$Weight of the sample

2.6.2.6 Total Carbohydrate

Total carbohydrate is estimated by using phenol sulphuric acid method (Sadashivm and Manickam , 2007).

Principle: In hot acidic medium glucose is dehydrated to hydroxymethyl furfural. This forms a grey coloured product with phenol and has absorption at 490 nm.

Reagents: Phenol 5%: Phenol dissolved in water and diluted to one litre. Sulphuric acid 96% reagent grade Standard glucose: Stock-100 mg in 100 mL of water. Working standard- 10 mL of stock diluted to100 mL with distilled water.

Procedure:

i. Weigh 100 mg of the sample into a boiling tube.

ii. Hydrolyses by keeping it in a boiling water bath for three hours with 5 mL of 2.5 NHCL and cool to room temperature.

iii. Neutralize it with solid sodium carbonate until the effervescence ceases.

iv. Make up the volume to 100 mL and centrifuge.

v. Pipette out 0.2, 0.4, 0.6, 0.8 and 1.0 mL of the working standard into a series of testtubes.

vi. Pipette out 0.1 and 0.2 mL of the sample solution in two separate test tubes. Makeup the volume in each tube to 1 mL with water.

vii. Set blank with 1 mL of water.

viii. Add 1 mL of phenol solution to each tube.

ix. Add 5 mL of 96% sulphuric acid to each tube and shake well

x. After 10 min shakes the contents in the tubes and place in a water bath at 25-30 °Cfor 20min.

xi. Read the color at 490 nm.

xii. Calculate the amount of total carbohydrate present in the sample solution using thestandard graph

. **Calculation:**

Absorbance corresponds to 0.1 mL of the test = x mg of glucose 100 mL of the samplesolution contains = 0.1 × 100 mg of glucose = % of total carbohydrate present

2.6.2.7 Total Protein

The protein content of the sample on dry weight basis is calculated by difference method(Jain and Mogra, 2006) as given below:

Protein (g/100 g) = 100 – (moisture + crude fiber + ash + carbohydrate + fat) 3.4.8 Energy

The energy value of sample is expressed as kcal·100 g –1 and calculated using the USDAconversion factors i.e. for carbohydrates 3.6 kcal·g –1, proteins 3.36 kcal·g –1 and lipids 8.37 kcal·g –1 Energy (kcal/100 g) = [(% protein x 3.36) + (% carbohydrate x 3.6) + (% fatx 8.37)]

2.6.2.8 Ash Content

Ash is estimated using muffle furnace method by placing about 2-5 g of sample for 24 h in amuffle furnace maintained at 103 + 1°C (FSSAI, 2012).

Figure 2.6.5 muffle furnace

Procedure:

i. Dry the empty dish and lid in the oven at 105°C for 3 hours and transfer to desiccatorto cool. Weigh the empty dish and lid (W_1).

ii. Weigh about 2-5 g of sample to the dish. Spread the sample to the uniformity. Closethe lids tightly and note their weights (W_2).

iii. Place the dish with sample in the muffle furnace with the lids open. Dry for 24hours at 103 +1°C.

iv. After drying, transfer the dish with partially covered lid to the desiccator to cool.

v. Reweigh the dish and its dried sample i.e., the bone-dry material (W_3).

vi. Ash on wet basis (w.b.) is calculated as mentioned.

Calculation:

Moisture content (%) = $((\mathbf{W}_2 - \mathbf{W}_3) / (\mathbf{W}_2 - \mathbf{W}_1)) \times 100$Where, W_1 = Weight of the empty box (g)

W_2 = weight of the box + weight of the sample (g)

W_3 = weight of the box + weight of the bone - dry matter

2.7 Sensory Analysis

Sensory analysis for soup developed were conducted based on nine-point Hedonic scale (1- dislike extremely, 2-dislike very much, 3-dislike moderately, 4-dislike slightly, 5-neitherlike nor dislike, 6-like slightly, 7-like moderately, 8-like very much and 9-like extremely) for the quality attributes of appearance, flavor, consistency, and taste, color.

CHAPTER-3

RESULTS AND DISCUSSION

3.1 PROXIMATE ANALYSIS OF INSTANT SOUP MIX :

The following are the proximate analysis were done and the results were discussed belowTable 3.1 proximate analysis of different soups

Samples	Moisture (%)	Ash(%)	Fat (%)	Protein (%)	Crude Fiber (%)	Carbohydrates (%)	Energy (Calories per 100 grams)
Control	8.41	9.98	1.43	10.32	4.03	61.52	315.384
S_1	8.46	9.62	2.46	12.93	4.09	58.33	313.48
S_2	8.49	9.52	2.73	12.84	5.13	59.18	311.76
S_3	8.53	9.28	2.52	12.22	5.08	60.03	309.48
S_4	8.62	9.26	2.46	12.32	5.06	61.04	321.648
S_5	8.74	9.77	2.42	12.45	5.11	61.72	335.804
S_6	8.77	9.32	2.32	12.03	5.03	60.07	327.230
S_7	8.44	9.13	1.40	12.18	5.02	61.02	323.73

From the above proximate analysis S_7 sample has the height moisture content compared to other proportions. Ash content is high in S_5 sample compare to all proportions. fat content is higher in sample S_2. S_1 sample has the highest protein content. S_5 sample has the highest crude fiber content. S_5 sample has the highest carbohydrate content among the all samples and S_5 sample has the higher energy (335.804calories /100 g) as compared to all the proportions.

3.2 DATA FOR SENSORY ANALYSIS:

The sensory evaluation is carried out with a team of 17 semi trained panel members. The evaluation procedure is carried out using 9 point hedonic scale in which attributes like color, taste, consistency, flavor, appearance and overall acceptability for the product, scoresare provided by each panel member.

Table 3.2 sensory analysis of the sample with control:

factors	**Control**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
Color	7	7.46	7.4	7.33	6.73	6.8	6.6	6
Taste	7	7.73	7	7.6	7.46	7.4	6.73	7.06
consistency	6.8	7	7.06	7.13	7.2	6.93	6.3	6.6
appearance	6.5	7.2	7.1	7.2	7.1	7.13	6.73	6.46
flavor	6.8	7.6	7.2	7.33	6.8	7.1	6.9	6.03
Over all acceptability	6.9	7.3	7.132	7.36	6.83	7.46	6.53	6

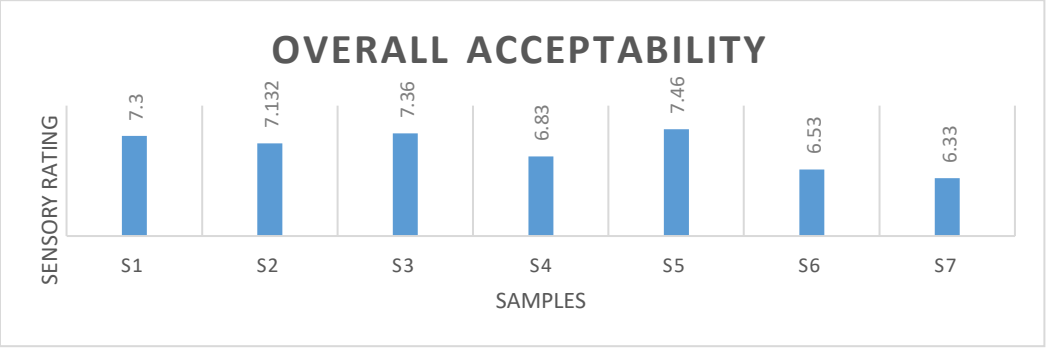

Figure 3.1 overall acceptability graph for soup samples

The values given in the table are based on the average of score given by 17 members and the significance of product is calculated by arithmetical mean method. From the table overall acceptability of S_5 samples is higher than the S_1, S_2, S_3, S_4, S_6, and S_7. And S_5 score is also good as compared with the control sample.

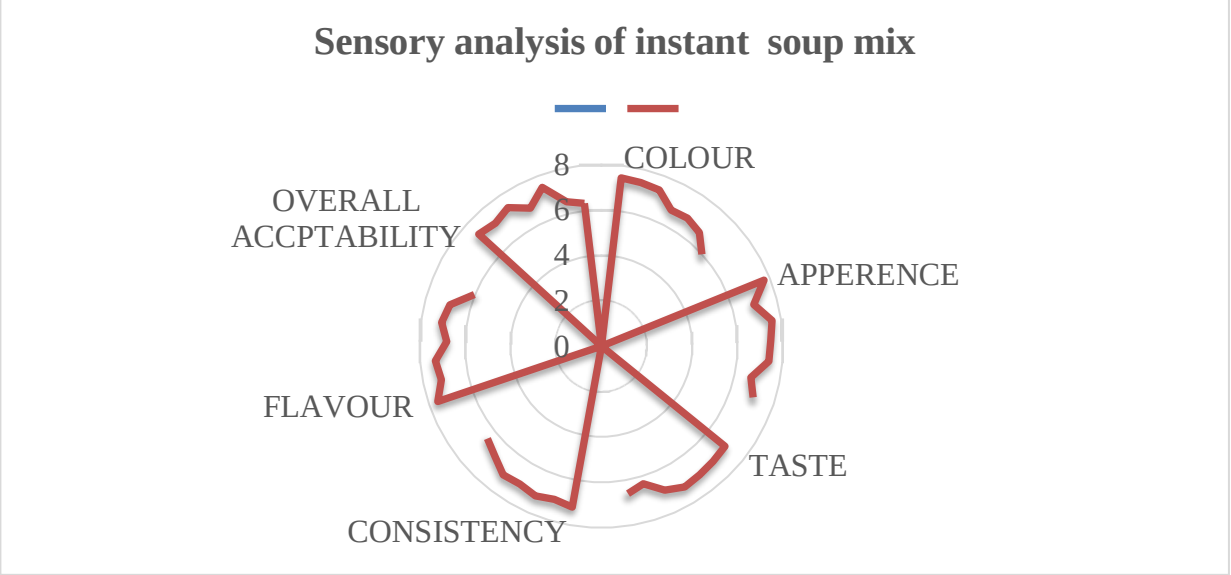

Figure 3.2 sensory evaluation of instant soup mix

CHAPTER-4

SUMMARY AND CONCLUSION

The present study was conducted on "Development Of Instant Soup Mix Incorporated With Chia Seeds (Sweet) And Butterfly Pea Flower (Clitoria Terntea)". The preparation of this instant soup mix includes many ingredients (Butterfly pea flower, chia seeds, corn flour, sugar, salt, spice powder, Dehydrated vegetables) in different proportions. Sensory analysis is conducted by providing samples to the sensory evaluators. From the results sample S_5 has superior organoleptic qualities followed by S_3 and S_1 samples.

S_5 sample is the good organoleptic properties and good overall acceptability and having the Moisture 8.74%, Ash 9.77%, Fat 2.42%, protein 12.45%, crude fiber 5.11%, carbohydrate 61.72%, Energy 335.804 calories per 100g. and its composition S5(3:3:46:38 :10), with butterfly pea flower (Clitoria Terntea), chia seeds (sweet), corn flour, spice powder and dehydrated vegetables.

These soup can be prepared by mixing 50g of soup mix in 500 ml of water and boiling for 3 minutes. And there is no added preservatives having shelf life of 97 days.

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