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Utilization of some natural plants sources in producing new product (gummy jelly candy)

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ABSTRACT

Jelly candies are circulating among many people and children which do not have nutritional value and contains synthetic dyes that are very harmful to the consumer body especially gummy jelly candy is highly favored by all circles. The idea of adding natural plant extracts which have good nutritional value into candy product have been developed. Five gummy jelly candies were made by adding natural plant extracts such as Lemon, peppermint, Tamarind, Red Roselle and date fruits with chocolate.

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The results showed that moisture content ranged from 15.119 to 20,001&,total soluble solids ranged from 60 to 61%, protein ranged from 10.809 to 19.949%, total sugars ranged from 54 to 58%, color at 420 nm ranged from 0.119 to 0.924, the result obtained that (T1) had the high content of total phenolic compounds (26.094 mg/g GAE) while (T2) had the lowest value (13.199 mg/g GAE) , meanwhile the values content of (T5), (T3), and (T4) were 18.147 , 17.892 and 15.926 mg/g GAE respectively. The antioxidant activity of gummy jelly candy ranged from 71.837 to 46.865 % respectively.

For the texture profile analysis (TPA) added date fruit juice and chocolate had the high value of all the parameters of TPA compared to the others treatments, while storage for three and six months led to increment and decrement in all the TPA of all gummy jelly candies treatments. Regarding sensory evaluation, no significant differences were found among the five jelly candies studied for most of the parameters, except treatment (T5) which a significant difference was observed in texture between it and the others at zero time these resultsconfirmed by the TPA analysis. Thedescription of the overall palatability by the panelists ranged between much palatable and palatable for all the products.Finally, it could be concluded through this study that it was, successful to produce gummy jelly candieswith adding natural plant extracts and offers a perfect candies forconsumers and children's which concerned about a healthy sweets

Keywords: gummy jelly candle, Gelatin, , Texture, profiler

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INTRODUCTION

Jelly candies are circulating among many people who do not have nutritional value and contains synthetic dyes and flavor that are very harmful to the consumer body especially jelly candy is highly favored by all circles. Candy is one of many food products liked by many people, especially by children. Candies can be basically grouped into two, hard candy and chewy candy. One of the candies belongs to chewy candy is jelly candy. Jelly candy is a candy made from water or juice and gel-forming material that looks transparent and has a texture with elasticity Hidayat, et al (2004). Based on the research conducted by same researchers, it is showed that fruit or vegetable jelly candy has better nutritional value. Jelly candy made from sucrose and juice with a ratio of 4:1 with the addition of gelatin concentration of 6% has the best quality. Fruit juice used is tomatoes, watermelon, orange, papaya, snake fruit (salak), apple or mango. The making of jelly candy with fruit flavor that is often used is the taste of oranges grapes, apples, seaweed, and strawberries. One of the ingredients of making jelly candy is water. Water can be replaced by extracting the natural plants sources. The process of making natural plants sources juice can be with either blender or juicer method.

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Jelly candy is one of the preferred types of confectionaries because it has a distinctive characteristic. The distinction lies in the taste, shape, elasticity and product elasticity Hambali et al (2004). Jelly candy made from fruits or vegetables has the advantage of nutritional value compared with those on the market that only come from the addition essence of chemicalmaterials.

Gelatin is one of the most widely used food ingredients, with wide applications in the food industry and in gummy jelly candy.

Gummy candy is a unique candy composed of gelatin, sweeteners, flavorings, and colorings. Because of its nature it can be molded into literally thousands of shapes, making it one of the most versatile confection products ever (Traxler, Hans.1993).

Traditionally different gelling agents such as gelatin, pectin, gum arabic or starch have been used for gummy candy production. A mixture of sugars, water and the gelling agent is boiled until desired soluble solids are reached and deposited into, where a specific shape is obtained. Then, candies are dried to their final moisture content and texture. Gelatin provides the gummy with a special elastic and chewy texture that is difficult to achieve with other hydrocolloids. (Ledicia et al 2013).

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Gummy candy recipes are typically developed by experienced food technologists and chemists. By blending together different ingredients, they can control the various characteristics of gummy candy, such as texture, taste, and appearance. The primary ingredients include water, gelatin, sweeteners, flavors, and color (Habilla et al 2011).

The idea of adding natural plant extracts into a candy product have been developed. Gummy jelly candies, represent approximately 50% of candy market value Garcia,(2000) are made with a base of gelatin. Customers prefer gummy jelly candies due to their unique texture.

gelatin is a tasteless and odorless compound that contains no fat, sweeteners and flavorings are added to give gummy candy its taste. texture and the amount of time it takes the candy to dissolve in the mouth can be controlled by the amount of gelatin used in a recipe. Various sugars are added as sweeteners.

artificial flavors that are mixtures of aromatic chemicals and include materials such as methyl anthranilate and ethyl caproate (Traxler, Hans.1993).

Jellies are defined by CAC section 2-2 (Codex Alimentarious commission (296 - 2009) as the products brought to semisolid gelled consistency and made from the juice and / or aqueous extracts of one or more fruits or vegetables, mix with foodstuffs with sweetening properties with or without the addition of water (Codex,2009).Jellies are made by cooking fruit juice with sugar.

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A good product is clear and firm enough to hold its shape when turned out of its container yet quivers when moved. When cut, jelly should be tender yet retained the angle of the cut. Jelly should taste fresh and fruity.

Therefore, the present study was carried out to use natural plants sources juices instead of synthetic color taste and flavor for produce gummy jelly candies with offers a perfect candies for children's which concerned about a healthy sweets**.**

Evaluation the nutritional quality, sensory attributes and analysis texture profile of the prepared gummy jelly candies.

MATERIALS AND METHODS

Materials

A-Lemon, peppermint, Tamarind, Red roselle and date fruits,sugars and cocoa powder were provided from local market at Giza governorate, Egypt.

B- Gelatin powder (G0038111) was purchased from El- Gomhoria Company for Trading Medicine and Chemical Egypt.

C-All chemicals and reagents used in this study were of analytical grade and purchased from El- Gomhoria Company for Trading Medicine and Chemical Egypt.

-Preparation of samples;

-Treatment No1; 30 gm peppermints were extract and blended with water, filtered to obtain natural extract (245ml).

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-Treatment No2; 10 gm red roselle soaking in water, then blended With blender, filtered to obtain natural extract (245ml).

-Treatment No 3; 50 gm tamarind soaking in water, then blended With blender, filtered to obtain natural extract (245ml).

-Treatment No4; 50 ml lemon juice and 15 gm peppermints were blended with 195 ml water, filtered to obtain natural extract(245ml)

-Treatment No5; preparing a mixture of water –fruit dates at a ratio3;1 (w/w),fruit dates extracts were filtered using white cloth to obtain natural extract (245ml).

Manufacturing of products with some modification:

The processing of gummy jelly candies were in two steps:

The first step:

A: Let the gelatin (15gm) swell in 90ml of previous natural extracts and dissolve in the water bath.

B: Mix 135 ml of the previous natural extracts with approx. 350 gm g sucrose in a bowel, boil the mixture then add the swell gelatin (A),boil for 25min.

The second step:

Dissolve 10 gm gelatin with 20 ml of the previous natural extracts then add to the final formula of step NO1,then add 5ml citric acid solution 50%, for treatment N5 add and mix 10-gram cocoa powder then pot the formulation products in molds, let them cool.

(Herbstreith & Fox KG,) Confectionery Gum and Jelly Products)

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Chemical analysis

Moisture content, crude protein, total soluble solids (TSS), pH value and total acidity were determined according to the methods of AOAC (2016). Total sugars were determined using Lane- Eynon procedure as stated in the AOAC (2007). The folin-Denis reagent was used to quantify total free phenols, as described by stratil et al (2006). Antioxidant activity was determined by the method of Sheng and Silva (2006). Color measurement of non-enzymatic browning was determined according to Ranganna, (1977).

-Texture profile analysis was determined according to Bourne (2003).

Sensory evaluation

Color, taste, odor, texture, and general palatability were rated on a ten-point scale, with ten being greatly liked and one being extremely despised. Male and female personnel of the Food Technology Research Institute (FTRI) were chosen as trained (Lee et al., 2003).

Statistical analysis

Steel and Torrie used the statistical package (Costat) software (version 6.311) to do an analysis of variance (ANOVA) on the data (mean standard deviation) (1980). A significance level of P0. 05 was used to indicate a significant difference.

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RESULTS AND DISCUSSION

Organoleptic evaluation of jelly candy treatments

Main value of organoleptic evaluation namely color, taste, odor, texture and acceptability of gummy jelly candies produced from the extract of peppermint (*Mentha*), Roselle (*Hibiscus Sabdariffa*), Tamarind (*Tamarindusindica L*), Lemon (*Citrus Lemon*) and peppermint (*Mentha*) and date fruits (*Phoenix dactylifera L*) are shown in Tables (1,2) at zero time and after storage for 3 months at room temperature. The obtained results revealed that there were no significant differences in the mean values of color, taste, or. texture, and palatability between all of the processed gummy jelly candies treatments, with the exception of treatment No5, which had a significant difference in texture between it and the previous gummy jelly candies treatments at zero time. The judges' descriptions of overall palatability ranged from much palatable to palatable for all of the goods. Finally, it was established from the aforementioned data from tables (1,2) at zero time and after three months that natural sources of plant color, taste, and flavor had the highest score and were chosen by customers. Also, the products of gummy jelly candies target all consumer categories and offers a perfect candies for children's which concerned about a healthy sweets.

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Table (1): Sensory evaluation of gummy jelly candies treatments at zero time.

Treatments	Color	Taste	Odor	Texture	Palatability
T1	7.95[a] ±1.257	7.95[a] ±1.012	7.75[a] ±1.275	7.95[ab] ±1.462	7.95[a] ±0.972
T2	8.3[a] ±1.337	7.95[a] ±1.654	7.5[a] ±1.434	8.6[a] ±1.265	8.063[a] ±1.311
T3	8.4[a] ±0.843	8.7[a] ±0.789	7.85[a] ±1.56	8.55[a] ±1.07	8[a] ±0.81
T4	8.9[a] ±0.568	8.05[a] ±1.423	8[a] ±0.943	8.65[a] ±0.747	8.4[a] ±0.558
T5	8.1[a] ±1.37	7.9[a] ±1.37	8.15[a] ±1.375	6.9[b] ±1.91	7.788[a] ±1.283

Gummy jelly candies treatments**:** T1: withpeppermint extract**,** T2: with Roselle extract,
T3: with Tamarind extract, T4; with Lemon and peppermint extract,
T5: with date fruits extract and chocolate.

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Table(2): Sensory evaluation of gummy jelly candies treatments after three months.

Treatments	Color	Taste	Odor	Texture	Palatability
T1	8.5[a] ±0.972	8.3[a] ±1.418	8.5[a] ±0.972	7. 7[a] ±1.337	8. 275[a] ±0.946
T2	8.9[a] ±0.994	8.4[a] ±0.966	8.4[a] ±1.35	7. 9[a] ±1. 595	8.375[a] ±1.107
T3	8.4[a] ±1.174	8.1[a] ±1.197	7. 9[a] ±1. 524	7. 8[a] ±1.476	8. 025[a] ±1. 233
T4	8.4[a] ±1.265	8.6[a] ±1.35	7. 9[a] ±1.287	7. 9[a] ±1.37	8. 225[a] ±1. 222
T5	7.8[a] ±1.476	7.4[a] ±1.174	7. 9[a] ±1.37	7[a] ±1. 7	7. 6[a] ±1.132

Gummy jelly candies treatments:
T1: with peppermint extract**,** T2: with Roselle extract, T3: with Tamarind extract, T4**;** with Lemon and peppermint extract, T5: with date fruits extract and chocolate.

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Chemical composition of gummy jelly candies treatments.

Table (3) showed the chemical composition of gummy jelly candy treatments (on dry weight basis), it could be observed that the moisture content of T1, T2, T3, T4, and T5 were 15.119, 17.569, 20.001, 16.868 and16.696 % respectively, also total soluble solids (TSS) for the previous treatments were 60,62, 61,61, and 61% , on the other hand treatment T5 had the high content of protein(19.949%) followed by treatment T2 (17.731%), treatment T3 (14.776%) ,treatment T1 (14.116 %) and 10.809% for treatment T4 respectively. A slight variation in total sugars wasobserved between all the gummy jelly candies products where T5 had the high content of sugar (58%) while T1, T2, T3, and T4 had the values 54, 56,57, and 57% respectively, This variation in total sugars may be related to the high temperature during processing which led to the hydrolysis of polysaccharides, hemicellulosesand cellulose in all products to monomeric sugars, ,Hernández et al (2012) , reported that temperature and time were the factors that had more effect on the release of reducing sugars. pH value ranged from 5 to 7 for all products of gummy jelly candies, total acidity ranged from 0.007 to 0.130% for the other treatments of jelly candies products. Results in the same table (3) showed the color of gummy jelly candies products which were 0.3 65, 0.119, 0.180, 0.924 and 0.238 at 420 nm for treatments T1,T 2, T3, T4 andT5 respectively.

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The high level of total phenolic compound (26.094 mg/g GAE) in T1 appeared to be primarily responsible for the significant antioxidant activities; the acquired data in Table (3) revealed that T2 had the lowest value (13.199 mg/g GAE).phenolic acids contents appeared to be mainly responsible for the strong antioxidant activities, the obtained data of Table (3) appeared that T1 had the high content of total phenolic compound (26.094 mg/g GAE) while T2 had the lowest value (13.199 mg/g GAE),meanwhile the values content of T5, T3, and T4 were 18.147, 17.892 and 15.926m mg/g GAE respectively.

Concerning antioxidant activity % FW, results revealed that T4 had the highestvalue of antioxidant activity than that in the other treatments (71.837%),followed by T2 (53.24%), T 3 (\52.695%), T5 (52,255%) respectively, while T1 had the lowest value (46.865%) of antioxidant activity

According to Murakami*et al*., (2004) and Buchner *et al*.,(2006), declines in phenol concentration do not always result in a loss in antioxidant activity, bec ause phenolic compound degradation products might have antioxidant activity that is sometimes higher than the original phenolic compound s.

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Table (3) Chemical Composition of gummy jelly candies treatments (on dry weight basis)

Treatments / Chemical Comp.	T1	T2	T3	T4	T5
Moisture%	15.119	17.569	20,001	16.868	16.696
Total solids%	84.881	82.431	79.999	83.132	83.304
Total soluble solid (TSS)%	60	62	61	61	61
Protein%	14.116	17.731	14.776	10.809	19.949
Total sugars%	54	56	57	57	58
PH	7	5.9	5.2	5.	7
Total acidity%	0.028	0.095	0.1 14	0.130	0.007
Color (at420 nm)	0.365	0.119	0.180	0924	0.238
Total phenolic content mg/g GAE	26.094	13.199	17.892	15.926	18.147
Antioxidant activity% fw	46.865	53.245	52.695	71.837	52.255

Gummy jelly candies treatments: T1: with peppermint extract, T2: with Roselle extract,
T3: with Tamarind extract, T4; with Lemon and peppermint extract,
T5: with date fruits extract and chocolate.

-Physical properties of gummy jelly candies ((Texture Profile Analysis (TPA)

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The different adding of the natural sources of plants instead of synthetic color taste and flavor were studied. Some physicochemical properties of the jelly candies products were determined as shown in Tables (4), (5) and (6).

The force-deformation of gummy jelly candies treatments are given in Table (4), The TPA attributes of five gummy jelly candies treatments carried out by adding natural sources of plants juice instead of synthetic color, taste and flavor. The gummy jelly candies (T5) with date fruit juice and chocolate had a firmness (hardness) value of 13.140 followed by jelly candies (T1), and (T4), (T3) with a value of 10.690, 7.190 ,7.135, and 6.820 for (T2), respectively. The firmness (hardness) is related to the strength of gel structure cycle (Muyonga et al, 2004)

The sensory meaning of firmness (hardness) is the maximum force required to compress a food between the molar teeth; (Szczesniak, 2002).

The cohesiveness (consistency) of food refers to the strength of intern al linkages that make up the meal's body and the degree to which it ca n be bent before rupturing.

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The five gummy Jelly candy treatments had cohesiveness values ranging from 0.739 to 0.925 (T5) gummy jelly candies with date fruit juice and chocolate had the highest value, while (T4) gummy jelly candies with lemon and peppermint juice had the lo west. The ratio of the positive force area during the second compression to the initial compression is referred to as cohesiveness. The pace at which the material disintegrates under mechanical operation can be quantified. Cohesiveness is shown in tensile strength.

The term texture refers to the combination of consistency and structur e. Texture indicates a product's mouth feel, such as its softness when b iting, how it disintegrates, how delicate it is, and how it adheres to the tongue during eating.

Table (4) shows the springiness values of the five gummy jelly candies treatments. When compared to other samples, gummy jelly candies with lemon and peppermint liquid had the lowest springiness value Springiness is a textural property related to the flexibility of the sample. TPA is linked to the height that the food regains between the end of the first mouthful and the start of the second bite.When springiness is high, the mouth requires greater mastication energy (Rahman and Al-Mahrouqi 2009).

In the same Table (4) are the gumminess values for the five gummy jelly candies treatments. The result of hardness and cohesiveness is referred to as Gumminess.

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The gumminess value of jelly gummy candies (N5) with date fruit juice and chocolate was higher than that of jelly candies with lemon and peppermint juice, as shown in the table. A higher firmness (hardness) score has resulted in more gumminess. (Al-Mahrouqi and Rahman, 2009).

Chewiness of the gummy five jelly candies treatments followed the same pattern as the gumminess property. Chewiness is a metric for how much energy it takes to masticate food, and it's usually used to describe solid foods.Chewiness is equivalent to the product of firmness (hardness), cohesion, and springiness. Five jelly candies treatments had chewiness values ranging from 4.303 to 10.287.Mastication entails squeezing, shearing, piercing, grinding, tearing, and cutting, as well as appropriate lubrication by saliva at body temperatures (Bhale, 2004)

Table (4) shows the resistance value of five gummy jelly candies. A higher value was obtained for gummy jelly candies (T4).

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Resilience is a measure of how quickly and forcefully a sample recovers from deformation (Brenda, et al 2005).After three months (Table 5) it was observed that a slight decrease was recorded in the firmness of T3 and T4(6.751and 6.059) cohesiveness of T1(0.890) and T5 (o.916), gumminess recorded decrement in T5(5.810) while T2, T3, T4 and T5 recorded a clear decrease in resilience properties as follows (0.910, o.772, 0.872 and o,839 respectively). On the other hand, a clear increase was observed in the other results of Physical properties of gummy jelly candies (Texture Profile) as shown in Table(5)

Concerning storage gummy jelly candies treatments for six months theresults in Table(6) appeared that a slight decrease was observed in the cohesiveness of T1(0.866) andT5 (0.911), gumminess of T3 to 5.514, while the resilience of T3, T4 and T5 decreased to 0.713, 0.778 and 0.782 respectively, On the other hand an increase was observed in the other results of Physical properties of gummy jelly candies when compared with the Texture Profile of gummy jelly candies treatments after storage for three months. When compared the results of Texture Profile after storage for six months of gummy jelly candies with the data of zero time it was found that a clear decrease was noticed in T3 and T4 of firmness, T1 and T5 of cohesiveness,T3 of gumminess and T2, T3, T4, and T5 of resilience as shown in Table (6).

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It was suggested that acid hydrolysis of gelatin contributed to decrease the gel strength of gelatin [FOW,2012), the data in the same table appeared increment in the other texture profile.

Table (4) Texture Profile Analysis (TPA) at zero time

Treatments / Chemical Comp.	T1	T2	T3	T4	T5
Moisture%	15.119	17.569	20,001	16.868	16.696
Total solids%	84.881	82.431	79.999	83.132	83.304
Total soluble solid (TSS)%	60	62	61	61	61
Protein%	14.116	17.731	14.776	10.809	19.949
Total sugars%	54	56	57	57	58
PH	7	5.9	5.2	5.	7
Total acidity%	0.028	0.095	0.1 14	0.130	0.007
Color (at420 nm)	0.365	0.119	0.180	0924	0.238
Total phenolic content mg/g GAE	26.094	13.199	17.892	15.926	18.147
Antioxidant activity% fw	46.865	53.245	52.695	71.837	52.255

Gummy jelly candies treatments: T1: with peppermint extract, T2: with Roselle extract,
T3: with Tamarind extract, T4; with Lemon and peppermint extract,
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Table (5) Texture Profile Analysis (TPA) after three months

Treatments	Firmness	Cohesiveness	Gumminess	Chewiness	Springiness	Resilience
T1	15.854	0.890	12.751	13.647	0.909	0.880
T2	9.535	0.989	8.553	8.320	0.959	0.910
T3	6.751	0.970	5.810	5.715	0.983	0.772
T4	6.059	0.956	5.512	6.106	1.049	0.872
T5	18.950	0.916	16.881	14.574	0.875	0.839

Gummy jelly candies treatments: T1: with peppermint extract, T2: with Roselle extract,
T3: with Tamarind extract, T4; with Lemon and peppermint extract,
T5: with date fruits extract and chocolate.

Table (6) Texture Profile Analysis (TPA) after six months

Treatments	Firmness	Cohesiveness	Gumminess	Chewiness	Springiness	Resilience
T1	23.00	0.866	19.913	18.648	0.935	0.910
T2	10.25	1.066	11.134	11.239	1.009	0.882
T3	5.100	1.081	5.514	6.307	1.144	0.713
T4	5.00	1.193	5.955	7.870	1.519	0.778
T5	23.05	0.911	21.006	18.664	0.888	0.782

Gummy jelly candies treatments: T1: with peppermint extract, T2: with Roselle extract, T3: with Tamarind extract, T4; with Lemon and peppermint extract, T5: with date fruits extract and chocolate.

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CONCLUSIONS

The results of this study suggest the use of natural plant juices instead of synthetic color, taste, and flavor in the production of gummy jelly sweets, as well as an assessment of nutritional content. Sensory attributes and analysis thetexture profile. The uses of natural plants sources juices consider a good source of natural compounds moisture, total soluble solids, protein, total sugar, total acidity, total phenolic compounds, and antioxidants are all taken into consideration. In comparison to the other treatments, the TPA added date fruit juice and chocolate had the highest value.while storage for three and six months led to increment and decrement in all the TPA as showed in the results. Regarding sensory evaluation, no significant differences were found among the five gummy jelly candies studied for most of the parameters, except treatment (T5) which a significant difference was observed in texture between it and the others at zero time. These results confirmed by the TPA analysis.For all of the goods, the panelists described the general palatability as ranging from much palatable to palatable. Finally, the products of jelly candies targetsall consumer categories and offers a perfect candies for children's which concerned about a healthy sweets.

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References

A.O.A.C. (2016). Association of Official Analytical Chemists International Official Methods of Analysis 20th, ed. Washington, DC.USA.

A.O.A.C.(2007). Official Methods of Analysis of the AOAC. International 18thEd Gaithersburg, Maryland, USA

Bhale, S.D.(2004). Effect of Ohmic Heating on Color, Rehydration and Textural Characteristics of Fresh Carrot Cubes. *Master's Dissertation, Louisiana State University and Agricultural and Mechanical College: Baton Rouge, LA,*

Bourue,M.C.(2003)Food texture and viscosity:Concept and measurement.Elsevier Press, New.york/London

Brenda, C.; Fermin, T.S.; Hahm, J.A.; Radinsky, R.J.; Kratochvil, J.E. ; Hall, M.L.Y (2005). Effect of proline and glutamine on the functional properties of wheat dough in winter wheat varieties. Journal of Food Science *70*, E273–E278.

Buchner, N. A.;Krumbein, S.; Rhon and L.W.; Kroh. (2006). Effect of thermal processing on the flavonolsrutin and quercetin. Rapid Commun. Mass Spectrom. 20, 3229–3235.

Codex Alimentarious commission (296 - 2009)

FAO. The state of world fisheries and aquaculture(2012) FAO annual report. Food and Agricultural Organization: Rome, Italy; 3–100.

Garcia., T.(2000) "Analysis and gelatin-based confections," *The manufactoring confectioner*, vol. 80(6), pp. 93-101, 2000

Habilla, C.; Slim, S.Y.; Nor Azizah, & Cheng, L.H. (2011).The properties of jelly candy made of acid-thinnedstarch supplemented with konjac glucomannan orPsyllum Husk Powder. *International Food ResearchJournal*, *18*, 213-220

Hambali. E. A.;Suryani dan Wadli.(2004). Membuat Aneka OlahanRumputLaut. Jakarta: PenebarSwadaya.

PRINT-ISSN: 2735-5373 VOLUME 3, ISSUE 2, 2022, 40 – 63. ONLINE-ISSN: 2735-5381

Herbstreith& Fox KG (Company Group).Herbstreith& Fox KG· Turnstraße 37 · 75305 Neuenbürg/Württ. · Food & Beverages

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-Hernández,J.C.G;Rosales,L.F;Jaramillo,M.A.Z; Navarrete,M.A.N; Villa,J.C.V; Corona,R.M,.1 Ma. Parga,D.C.C.C; and Antonio Peña,A. (2012). Chemical Hydrolysis of the Polysaccharides of the Tamarind Seed. J. Mex. Chem. Soc. 2012, 56(4), 395-401

Hidayat, Nur dan Ken Ikariztiana. MembuatPermen Jelly. Surabaya: TrubusAgrisarana.(2004).

Ledicia, P. G. (2013). A Novel Carrageenan for Vegetable Gummy Candy Production food Marketing & Technology

-Lee, J.Y.; H.J. Park, C.Y. Lee and W.Y. Choi. (2003). Extending shelf life of minimally processed apples with edible coatings and antibrowning agents. Lebensm.-Wiss. U. - Technol. 36:323-329

Murakami, M., T.Yamaguchi, H.Takamura and T.Matoba.(2004). Effects of thermal treatment on radical-scavenging activity of single and mixed polyphenolic compounds. Food Chem. Toxicol. 69, 7–10.

Muyonga, J.H.; Cole, C.G.B.; Duodu, K.G. (2004). Extraction and physico-chemical characterization of nile perch (*Latesniloticus*) skin and bone gelatin. Food Chemistry *86*, 325–332

Rahman, M.S.; Al-Mahrouqi, A.I. (2009). Instrumental texture profile analysis of gelatin gel extracted from grouper skin and commercial (bovine and porcine) gelatin gels. International Journal of Food Sciences and Nutrition, *60*, 229–242**.**

Ranganna,S.(1977). Handbook of Analysis and quality control for Fruits and Vegatable products.2nd ED. New Delhi. India

Sheng, S. M. N. and J. L. Silva. (2006). Antioxidant activity, anthocyanins and phenolics of rabbiteye blueberry (*Vacciniumashei*) by-products as affected by fermentation. Food Chemistry, 97(3): 447-451.

PRINT-ISSN: 2735-5373 VOLUME 3, ISSUE 2, 2022, 40 – 63. ONLINE-ISSN: 2735-5381

Steel, R. G. and Torrie, T. H. (1980). Principles and procedures of statistics. Abiometrical approach. McGraw Hill Book Comp., Inc., New York, USA.

stratil,P.;Klejdus,B. and Kuhan,V. (2006).Determination of total content of phenolic compound and their antioxidant activity in vegetable evaluation of spectrophotometric methods .J.Agric.Food Chem., 54.607-616.

Szczesniak, A.S.(2002). Texture is sensory property. Food Quality Prefer 2002, *13*, 215–225.

Traxler, Hans. (1993). The Life and Times of Gummy Bears. Harper Collins