



Manufacture of coffee and cake from the kernel of dates

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Abstract:-

The aim of the research is to manufacture caffeine-free coffee and manufacture a product with added date kernels and the research problem was identified in the following questions Is it possible to manufacture coffee from the date kernel free of caffeine? Can the nutritional value of nutrients be enhanced with date seeds? An experiment was conducted by manufacturing coffee and cake from date kernel powder and was evaluated sensually and the results were as follows: Coffee prepared with date kernel powder obtained the following results: color 86.25%, flavor 76.25%, texture 81.25%, taste 80%, general acceptance got 82.5% The cake prepared with date kernel powder obtained the following results: The sample (C plus 10% date kernel powder) in terms of fragility, color, flavor, texture, taste and general acceptance obtained the highest scores compared to sample B (added to 5% date kernel powder) and then sample A (free of date kernel powder) and the research recommendsTherefore, we recommend coffee lovers to eat date kernel coffee because it is caffeine-free, and we recommend diabetes and pressure to eat date kernel coffee, as it works to reduce sugar and blood pressure, and we recommend kidney patients to eat date kernel coffee, as it works to break up stones and add date kernel powder to the cake by 10% to raise the nutritional value, increase fragility, acquire the desired taste and color, and use date kernel to reduce natural waste and benefit from its nutritional value.

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Introduction:-

Known as the fruit of the date palm tree, dates are one of the staple foods in the Middle East.

(Nagdeve, Meenakshi2020) Dates are a rich source of dietary fiber that may

Helps reduce the risk of constipation and contains a range of antioxidants

Date seeds are the inedible part of the fruit

, processing dates results in a large amount of date seeds that are usually disposed of as a waste product

Or used in animal feed Date seeds are a by-product of the food industry proven to be highly nutritious

Date seeds are rich in organic molecules such as edible oil (6.79) - 12.00%, proteins 4.31) -

6.14%, polysaccharides 8.70 - 9.54% (hemicellulose 43.48%, cellulose 12.84%)

and lignin (6.42%). The date kernel is rich in many nutrients that are beneficial to health, such as fiber,

and minerals, including: magnesium, selenium, copper, calcium, potassium, zinc

al,2014) et Plata Carine (date kernel is defined as the solid body, and its shape is rectangular,

and pointed at its ends, occupying the center of the fruit, and its weight ranges between -0.5 to 4 g, and its length is 20-12 mm,

Its width is 15-6 mm, and the length of the seed is usually three times its width, which represents -10

20% of the weight of the whole fruit.Abdul Basit Odeh Ibrahim, (2016) The date kernel contains a high percentage of dietary fiber, which has therapeutic benefits for some health conditions, such as diabetes,

high fats, and obesity, and can also prevent high blood pressure and date kernel is used in many Uses because it contains a lot of fatty acids such as sulfuric acid, lauric acid, And citric acid, myristic acid, and polymeric acid, and became used date kernel to prepare healthy coffee, is considered a healthy alternative to coffee because it is devoid of caffeine Al-Farsi, 2011 '(Mohamed) Not only are date kernel coffee not limited to caffeine-free, but there are many health benefits of this coffee that distinguish it from regular coffee, such as preventing infection. Cancer and the fragmentation of kidney and gallbladder stones and preventing the accumulation of harmful cholesterol in the arteries , 2017 et al Niazi sobia (

One of the benefits of date kernels is to protect the liver because it contains a good amount of antioxidants Oxidation, and the prevention of diabetes complications Diabetes complications may lead to kidney failure or liver failure help prevent such complications, and antiviral, and protect the kidneys because they contain

Polyphenols help get rid of plaque in the kidneys and bladder that cause stones and prevent damage

Cells because they contain ample amounts of antioxidants (Malak Malkawi ') 2020, for date kernels and its use as coffee, women consider it one of the most powerful nutrients and diuretics for breastfeeding women's milk, and it also helps date kernels if used as incense after childbirth, to return the uterus to its place, and to relieve joint pain

(Abdul Basit Odeh Ibrahim) (2016,

The aim of the research is to reduce agricultural residues and enhance the nutritional value of food industries by manufacturing coffee from the date kernel and adding date kernel powder to the cake and the target group of this research is the Saudi society .

Search problem :

Is it possible to make caffeine-free coffee from date kernels?

.Can the nutritional value of nutrients be enhanced with date seeds?

Research Objectives :

Manufacture caffeine-free coffee.

Manufacture of an additive product with date kernel.

The importance of research :

The importance of the study is due to the use of an alternative to caffeine-free coffee with therapeutic benefits and high nutritional value, raising the nutritional value of the cake and improving its properties.

Research hypotheses:

Date kernel coffee has harms?

Can date kernels be added as an alternative to chocolate flavor?

Research Methodology:

Descriptive The research depends on references from scientific research that serves the subject of the research, experimental is the manufacture of cake containing the kernel of dates and the manufacture of coffee from the kernel of dates

Spatial boundaries: Department of Home Economics, King Khalid University, College of Science and Arts in Tihama

Time limits : first semester 1444 AH

Previous studies

Dates are produced from the date palm tree, which is commonly used in the Middle East, and it is also a staple food in arid and semi-arid regions around the world, and dates contain a kernel, or the so-called seed or ajam dates, which is part of the fruit that consists of a full fruit shell and the kernel, which constitutes between 15-10% of the weight of the fruit, based on the type and quality of the fruit (Chang and Farsi AL Mohamed' (Lee, 2011 Razan Najjar (2017) indicated in her study that the date kernel inside the fruit itself is no less important than the date fruit itself, as it contains many important nutrients that benefit humans and is rich in proteins and fats, and also contains different amounts of carbohydrates, fiber, antioxidants and phenolic compounds The kernel contains 5,62% of its weight Carbohydrates 49,8% of fats 22,5% of protein 20,16% of dietary fiber 5,6% of its weight is water and about 12,1% ash be that he can (Michela Verni and Federico Casanova, 2022) and pointed out

The use of major waste products from the food industry has a significant environmental impact and can be a way to improve consumer health Date seeds are a by-product of the food industry proven to be highly nutritious as they contain flavonoids'2003) (Ashrafjahani, Date kernel powder is a waste of the agricultural sector and food industry which, after processing, can be used as a functional additive to form part of human food.

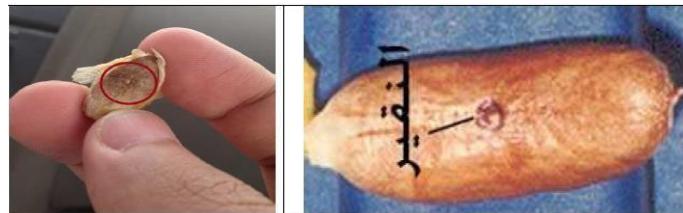
Installation of the kernel



The color of the seed is dark brown, the dorsal side is convex and has a small, rounded low click that is the fovea whose location varies according to the varieties, and the ventral side has a slit or groove that extends along the seed. The ventral groove may be wide or narrow or may release at one end and narrow in the middle or be sunken outside the nucleus, there is a very light membrane and the Qur'an mentioned it once as the katamir on the nuclei of dates, which is a thin membrane (Abdul Basit Odeh Ibrahim) 2016,



There is a thin thread between the two cotyledons of the nucleus on the crack of the nucleus and the Qur'an mentions it as a fuse and in the back of the core there is like a small click



2016 Abdul Basit Ibrahim



Under this incision there is a small rectangular body called the fetus, and all the solid material that surrounds it is a food stored for him if the conditions of moisture and heat are available, the fetus will grow, God willing, and will appear from the click. Abdul Basit Ibrahim Odeh (2016),

Content (dry weight)	Habit
% 20.64	Starch
% 2.46	Reducing sugars
% 1.98	Non-reducing sugars
9.20%	Fat
6.43%	Proteins
% 0.038	Calcium
% 0.112	Phosphorus
% 0.244	Potassium
% 0.082	Sodium

(Abdul Basit Ibrahim Odeh 2016)

According to the varieties, the seed consists of:

The seed shell is a thick, hard wall that surrounds the embryo and endosperm.

The embryo, which is a small thin white body, oval in shape, 2 mm long and 1 mm thick, occupies the middle of the dorsal surface of the nucleus, just below the opening of the pal, endosperm endosperm, which represents the largest part of the seed, consisting of a semi-transparent solid substance Hemicellosia cotyledonous embryonic leaf and consists of the absorbent part that remains inside the seed and takes a crescent shape that gradually expands at the expense of the endosperm at germination, and from the sheath

Cotyledon, which is in the form of a tube that comes out of the opening of the peck when germinating the seed and contains the root and the feather and has a great ability to bend the ground

Cotyledon consists of three types of cells Barenchyma, Procambiom, and Proturdemia and is characterized by their different shape, size and location, and all cells are characterized by containing prominent nuclei with nuclei and chromatin

Abdul Basit Ibrahim Odeh (2016) indicated that the chemical content of date kernels was estimated, as the estimates were as follows:

Moisture 6.46%, protein 5.22%, fiber 16.20%, fat 8.49%, carbohydrate 62.51% and ash 1.12%. The analyzes also showed the presence of percentages of fatty acids, including: sulfuric acid 0.7%, capuronic

acid 0.5%, lauric acid 24.2%, myoacetic acid 9.3%, palmitic acid 9.9%, oleic and linoleic acid 25.2%, and cetic acid 3.2%. The studies proved high levels of fat and protein, where they were 5.2-1.8% fat, and 6.5-3.4% protein, and the percentage of saturated and unsaturated fatty acids in them converged in addition to the high rate of nutritional fiber in them.

Abdul Basit Odeh Ibrahim (2016) pointed out that there are high levels of aspartic amino acids, Glutamic and arginine, followed by tryptophan, isoleucine, and lysine, in small quantities. As for Kernel oil is characterized by a pale yellow color, good smell and its most important characteristics: density 0.920, refractive index 1.46, iodine number 55-50 saponification number .210-205

Fatty acids in date seeds:

stated that oleic acid + linoleic acid -44.2 52.2%, and acid

11.5, palmitic acid 9.9 – 10.3 and this

calculated ratios of total fatty acids.

Amino acids in date seeds:

As for the fatty acids in the date kernels, their

percentages were as in Table 2

2.Table 2 Fatty acid ratios in date kernels

Percentage (%)	Sour type
0.7	The capricious
0.5	capernic
24.2	Lauric
9.3	Myostic
9.9	Palmitic
25.2	Oleic and linoleic
3.2	Stearic

Abdul Basit Ibrahim Odeh (2016)

Date kernels contain 2-1% ash and consist of mineral elements shown in Table 3.

Table3Mineral elements in the ashes of date kernels

Percentage (%)	Sour type
167	Mg
605	K
8.9	Ca
3.7	Fe
39.8	Na
2.8	Cu
1.23	Li
0.02	Cl

Abdul Basit Ibrahim Odeh (2016)Nutrients in the date kernel

(Mohamed AL Farsi and Chang Lee,2008)

Lauric 17.4 24.2-%, mercetic acid -93

The date kernel contains good proportions of, selenium, magnesium, potassium and copper, in addition to containing phosphorus, iron, calcium, and zinc.

The core contains that (Walid Al-Shahib and Richard Marshal, 2003) and clarified

14 types of fatty acids, including

Unsaturated fatty acids such as palmitoleic acid, linoleic acid, linolenic acid and oleic acid, which have a percentage ranging between 58.8-41.1 which may make the date kernel a source of this acid ,%

Dietary fiber

Najafi, Mohammad (2011) pointed out that the reason why date kernels have good nutritional value is their content of dietary fiber, which is very suitable for preparing foods rich in fiber as well as supplements.

Several potential uses for date seeds have been identified:

Mahmoud, 1994) and (Almana) explained in their study the uses of date seed powder as an ingredient in food products such as bakery products, as they mentioned (Al, 2017) et (Bouaziz) that date seed powder can be used as an ingredient in chocolate, and pointed out, 2016) (Venkatachalam) that date seed powder can be used as an ingredient in non-caffeinated beverages in practice, and mentioned 2007 (al, et (Rahman) Roasted date seed powder is used in the Arab region to prepare a coffee substitute drink (as explained) 2016 al, et (Venkatachalam) that the coffee substitute drink is good to avoid negative health effects, such as high blood pressure, panic attacks, high blood pressure, gout, insomnia, indigestion, infertility, inhibition of collagen formation in the skin, as well as symptoms of depression and anxiety resulting from the high caffeine content in coffee.

(2014) al et sheikh (EL) stated that the drink made from roasted date seeds can be safely consumed and served to people who are sensitive to caffeine and prefer to enjoy the distinctive flavor and aroma of caffeine-free coffee without the harmful effects, and they stated, 2015 (al et Ghnimi) that it is interesting that roasted palm seeds contain similar aromatic compounds (alcohols and aldehydes) and most importantly they are caffeine-free.

Add date seed powder to baked good

(El-Shahat Gomaa El-Dreny and Marwa Mustafa Shaheen,2022)

They pointed out that this research was conducted to evaluate the benefits of date seed powder.

By adding it to bakery products to enhance the nutritional value of these products and maximize the value of chemical composition, mineral elements, amino acids, fatty acids, phenols were then added to toast in 5, 10 and 15% as a substitute for wheat flour. Properties were evaluated

Organoleptic for these products. The results of these investigations revealed that date seed powder contains important minerals, saturated fatty acids, antioxidants and amino acids and all of these compounds have an effective effect on the health of the body, in addition, it was found that the organoleptic evaluation of toast is acceptable by the judges, and therefore the possibility of adding date seed powder to bakery products.

Acharro, 2013 (al and Platat (Caring in their study that date seeds are an excellent source of antioxidants that contribute to reducing the risk of chronic diseases and date seeds were used as a functional nutritional component for the development of bread with enhanced antioxidant ability by replacing wheat flour with different levels of date seed powder (5), 10, 15 and 20 (it was observed that bread containing 20% of date seed powder contained significantly higher amounts of fiber and fat compared to others The antioxidant content was significantly higher in baking date seed powder. These results show that bread containing date seed powder shows higher flavonoid levels and antioxidant ability compared to regular wheat bread and whole wheat bread.

Making cocoa from date seed powder:

Asharro, 2016) al et Bouaziz Ali (Mohamed) that the new spreadable chocolate was enriched with soluble and insoluble dietary fiber from Tunisian date seeds Tigris Nour at levels of 1, 2, 3, 4 and 5% in the spread of traditional chocolate Defatted date seeds Tigris Nour was characterized by containing soluble and insoluble fiber. Sensory evaluation showed that all types of chocolate spread were accepted by committee members Date seeds are a new source of dietary fiber for chocolate development. Spreadable and improve health benefits and functional properties.

The use of date seed powder in sponge cake:

In their study, they demonstrated that 5% and 10% amounts of date seed powder were added to the sponge cake and compared to the control sample in terms of texture (hardness, cohesion).

Elasticity, chewing, salt, protein, fat, fiber and sensory evaluation were assessed. The results showed that different levels of date kernel powder has a significant effect on the level of hardness and cohesion, the protein and fiber content increases with the increase in the amount of date kernel powder in sponge cake, the test results showed that the 10% date kernel powder in the sponge cake has the highest percentage of general acceptance in terms of sensory evaluation, showed good potential as a valuable and economical food ingredient to be used in food products and can be used in food formulations and also as a functional food.

Making date seed coffee:

Al,2015 et (Ghnnimi stated that the quality characteristics of date seed coffee were determined and compared with traditional Arabic coffee, it was found that date seed coffee contains a smaller amount of total phenolic compounds and is also a less potent antioxidant than Arabic coffee, phytochemical examination showed that date seed coffee contains stimulants, tannins, and coumarins, while caffeine was not detected, the sensory evaluation showed that date seed coffee was acceptable It was seed coffee Dates are lighter in color, less mysterious, less bitter, and less flavorful compared to traditional Arabic coffee

Therapeutic benefits of date kernel Liver protection

Malak Malkawi (2020) stated that date kernel coffee works to protect the liver from failure, as a result of Because it contains a good amount of antioxidants

Prevention of diabetes complications

Malak Malkawi explained that diabetes has complications that may lead to kidney failure or liver failure, eating date kernel coffee helps prevent such complications.

Antiviral

Malak Malkawi 2020 stated that one of the most important benefits of date kernel coffee is the prevention and treatment of several types of viruses, and bacterial infections that may follow viral infection.

Kidney protection

Malak Malkawi2020 explained that the protection and prevention of kidney failure is one of the most important benefits of date kernel coffee because it contains polyphenols, and helps get rid of plaque in the kidneys and bladder that cause stones.

Prevents cell damage

Malak Malkawi stated in 2020 that drinking date kernel coffee helps prevent damage to the body's cells, because it contains ample amounts of antioxidants.

Benefits of date seed oil:

Habib Ibrahim (2008) explained that the most important fatty acids in date seed oil are oleic acid, then myristic acid and linoleic acid, the 18 date seed oils portrayed large concentrations of vitamin E and vitamin K, with a strong possibility of using date seed oil as a source of essential fatty acids in edible oil.

Benefits of date kernel coffee for Alzheimer's treatment:

Nahla (2021) indicated that caffeine and coffee have effective therapeutic interactions against Alzheimer's disease to compare the effect of moderate caffeine coffee and decaffeinated coffee on cognitive impairment.

Date seed coffee was given to rats to protect them from memory impairment and has low serum levels of the central pathogen in Alzheimer's disease. These results point to the amazing therapeutic potential of coffee to relieve Alzheimer's.

How to conduct research

An experiment was conducted to manufacture coffee and cake from the kernel of dates, where raw materials (dates, cake-making ingredients) were purchased from the markets of Muhayil Asir, where the cores were extracted from dates, washed well, dried and roasted in the oven at a temperature of 180 m until the color changed to dark brown, then grinded finely and manufactured coffee and cake, then evaluated sensually by the employees of the College of Science and Arts, King Khalid University in Tihama (faculty members, Administrators, students)

Manufacture of coffee from the date kernel:

Ingredients/

1 liter boiling water

2 45g date kernel powder

3. Add-on al-Nikhaah (Al-Qarnfil, Zanjbeel, Sakar)

Method/

The date kernel powder was added to the water in Bakraj and left over medium heat until it reaches the boiling point was added cardamom, cloves, ginger and sugar and then was served

Manufacture of cake from date kernel:

Sample A control free of date kernel

Ingredients/

200 jaram of daqeqah 200 ja'rum daqiqah

Method/

In a bowl, the eggs were whipped with sugar well and add oil and milk while continuing to stir and add a pinch of salt and baking powder and add vanilla and flour after sifting and stirring it to reach the appropriate consistency of the cake dough and was poured into the cupcake molds and inserted into the oven at a temperature of 180 degrees for 15 minutes.

Sample B Add 5% Date kernel powder Ingredients/

190 Jaram Al-Daqiq 10 Jaram Mashouk Nawaat al-Tamar

Method/

In a bowl, the eggs were whisked with sugar well and add oil and milk to it, continue to stir, add a pinch of salt, baking powder, vanilla, date kernel powder and flour after sifting and stirring it to reach the appropriate consistency of cake dough and was poured into cupcake molds and inserted into the oven at 180 degrees for 15 minutes

Sample Cadd 10% Date kernel powder Ingredients/

180 jaram daqiq 20 jaram mashouk nawaat al-tamar

Method/

In a bowl, the eggs were whisked with sugar well and add oil and milk to it, continue to stir, add a pinch of salt, baking powder, vanilla, date kernel powder and flour after sifting and stirring it to reach the appropriate consistency of cake dough and was poured into cupcake molds and inserted into the oven at 180 degrees for 15 minutes

Coffee & Cake Evaluation Forms

Evaluation of cake with added date kernel

General Admission	Bait	Textures	Flavor	Color	Fragility	Item
						A
						B
						C

Evaluate the item in front of you according to the following degrees

Acceptable1=

Good2=

Very good3=

Excellent4=

Evaluation of caffeinated coffee made from date kernels

General Admission	Bait	Textures	Flavor	Color	Evaluation
					coffee

Evaluate the item in front of you according to the following degrees

Acceptable1= good2= Very good3= Excellent4=

Results and discussion

An experiment was conducted to make coffee from the date kernel and evaluate it sensually in terms of (color, flavor, texture, taste, general acceptance)

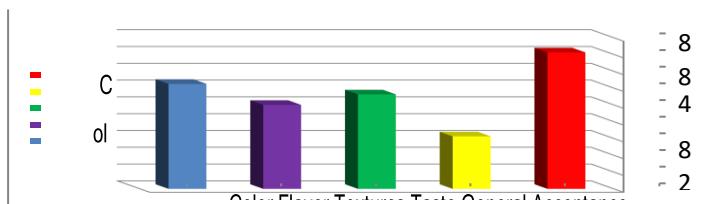
Evaluation of Date Kernel Coffee

As shown in the figure above, the color got 86.25% and the flavor got 76.25%

The texture got 81.25%, the taste got 80%, and the general acceptance got 82.5%.

Date kernel coffee has received very excellent acceptance among residents

Male Al-Farsi,2011) (Mohamed in his study that the kernel of dates is used to prepare coffee



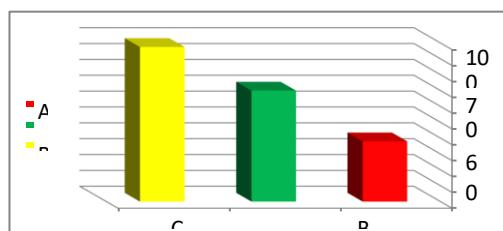
Health, it is considered a healthy alternative to coffee because it is free of caffeine (Asharwaal,2017) et Niazi sobia (in their study that the benefits of date kernel coffee are not limited to caffeine-free, but rather There are many health benefits of this coffee that distinguish it from regular coffee, such as lithotripsy Kidneys and gallbladder and prevent the accumulation of bad cholesterol in the arteries reported) d. Malakawi (2020,

One of the benefits of date kernel coffee is to protect the liver, prevent diabetes complications, protect the kidneys and prevent

Cell damage (2015) and (Ghnimi indicated that the organoleptic evaluation of date seed coffee was acceptable. Date seed coffee was lighter in color, less mysterious, less bitter and less flavorful as date seed coffee compared to traditional Arabic coffee.

An experiment was conducted to make a cake from the date kernel and evaluate it organoleptically (fragility, color, flavor, texture, taste, general acceptance) in samples A, B, and C

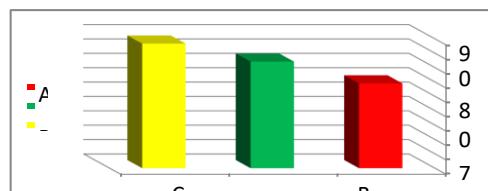
Fragility



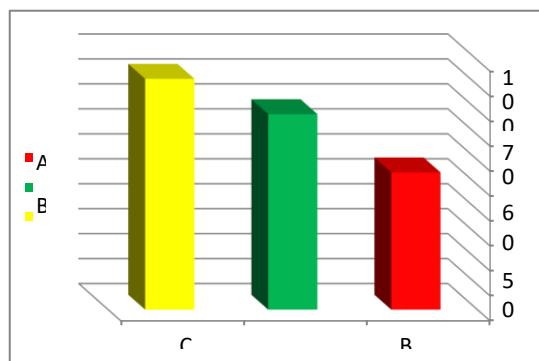
As shown in the figure above, the sample (C% date seed powder) received the highest rating of Where the fragility is 97.5% compared to sample B 5) date seed powder (70%) and sample A free of Date seeds 38%

Color

As shown in the figure above, the sample (C% date seed powder) received the highest rating of Where color 86.66% compared to sample B 5) date seed powder (74.16%) and sample A free of Date seeds 59%

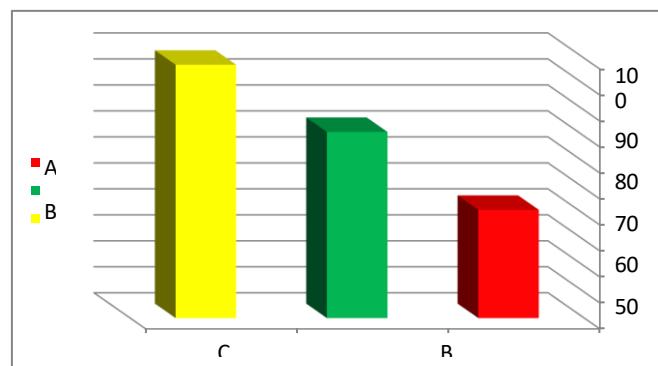


Flavor

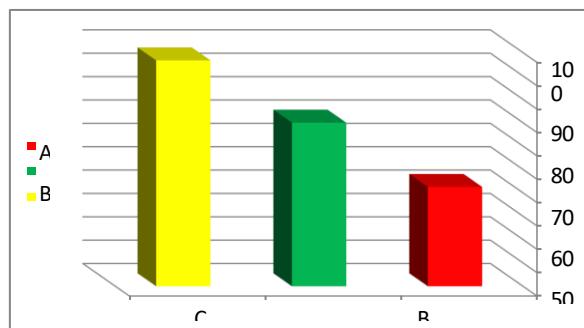


As shown in the figure above, the sample (C% date seed powder) received the highest rating of 92.5% compared to sample B 5% date seed powder (78.33%) and sample A free of Date seeds 55%

Textures



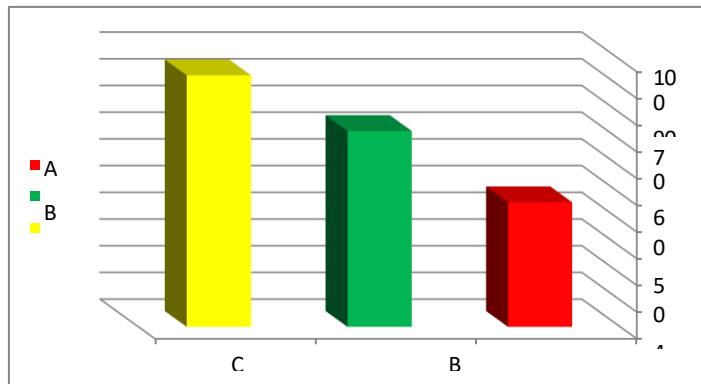
As shown in the figure above, the sample (C% date seed powder) received the highest rating of 97.5% compared to sample B 5% date seed powder (71.66%) and sample A free of Date seeds 41.66%



Bait

As shown in the figure above, the sample (C% date seed powder) received the highest rating of Where the taste is 96.66% compared to sample B 5) date seed powder (70%) and sample A free of Date seeds 42.5%

General Admission



As shown in the figure above, the sample (C% date seed powder) received the highest rating of Where the general acceptance is 94.16% compared to sample B 5% date seed powder (73.33%) and sample A

Date Seed Free 46.66%

Conclusion :

An experiment was conducted to manufacture coffee and cake from date kernel powder and was evaluated sensually and the results were as follows Coffee prepared with date kernel powder obtained the following results: color 86.25%, flavor 76.25%, texture 81.25%, taste 80%, general acceptance got 82.5% and cake prepared with date kernel powder got the following results: The sample got (C) Added to it 10% date kernel powder (in terms of fragility, color, flavor, texture, taste and general acceptance at the highest degrees compared to sample B (added to 5% date kernel powder) and then sample A (free of date kernel powder)

Recommendations :

Based on previous studies that have been compiled, we recommend the following

- 1 We recommend coffee lovers to consume date kernel coffee as it is caffeine-free
- 2 We recommend diabetes and pressure to eat date kernel coffee as it works to lower sugar and blood pressure
- 3 We recommend kidney patients to drink date kernel coffee, as it works to break up stones
- 4 We recommend adding date kernel powder to the cake by 10% to raise the nutritional value, increase fragility and acquire the desired taste and color
- 5 We recommend using date kernels to reduce natural waste and benefit from its nutritional value

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