Mansoura University

Faculty of agriculture

Food Industries Department

PRODUCTION OF HIGH NUTRITIONAL VALUE DONUTS

Graduation project submitted by

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INTRODUCTION

Introduction

This study is conducted for the purpose of producing a donut with a high nutritional value and selected some components with a high nutritional value such as

Beet The beet, Beta vulgaris is a plant in the Chenopodiaceae family. It is best known in its numerous cultivated varieties, the most well-known of which is the purple root vegetable known as beetroot or table garden beet. However, other cultivated strains include the leafy vegetables chard and spinach beets, as well as the root vegetable sugar beet, which is important in sugar production.

Mint with vernacular name of "nana felfeli", a plant from Labiatae family is traditionally used as antiseptic, stimulant, carminative agent or is used as flavoring agent in cosmetic and pharmaceutical industries throughout the world. According to its antiseptic activities, there are some investigations on its antimicrobial activities. The peppermint essential oil and its ethanol extract exhibited antifungal activity against Candida parasilosis, but its infusion did not have any antifungal activity .

Nescafe the beginnings of Nescafe can be traced back to 1930, when the Brazilian government first approached Nestle. At that time Brazil had a huge coffee surplus and it was felt that coffee consumption would increase if a new product were developed. While there were some forms of crystallized or liquid in the market, they were not readily soluble and tasted horrible. The Brazilian Coffee Institute approached Nestle's chainman and asked

to develop coffee that would be soluble in hot water but would retain its original flavor.

Eggs are an important source of human food and enable humans to eat bird eggs and is composed of albumin, egg yolks and bird eggs is preferred to many people has made the taste of white to multiple uses and increased consumption of the world.

Milk and Dairy consumption are frequently included as important elements in a healthy and the nutritional importance of milk in the human diet and reinforce the possible role of its consumption in preventing several chronic conditions like cardiovascular diseases (CVDs), some forms of cancer, obesity, and diabetes. It is the first food for mammals and provides all the necessary energy and nutrients to ensure proper growth and development, being crucial in respect to bone mass formation.

Butter Milk Naturally fermented buttermilk, prepared from soured cream or milk ,its chemical composition and flavour compounds Protein, fat, organic acids, carbohydrates . Buttermilk calories. Being a good source of calcium and is low on fats and diet on a regular basis. Buttermilk vitamins, it can included in the acid bacteria which contains good bacteria called The Lactic helps in improving the immunity of the body.

Yeast (Saccharomyces cerevisiae) is unicellular fungi that divide asexually by budding or fission and whose individual cell size with a large diameter of 5-10µm and a small diameter of 1–7µm. The cells of S. cerevisiae are pigmented,where cream color may be visualized in surface grown colonies. Yeast cell is

completely deferred than bacterial cell in both structure and function .

THE AIM OF PROJECT

The aim of this project is to produce a donut with high nutritional value. This is done by making donuts of the following types: beets, mint, Nescafé, eggs, milk and butter milk. Donuts can be used as functional food in the following cases: Fortification of a traditional product with nutrients , and it is a fortified food for children, and it is also considered a healthy product for Nescafe lovers. Then sensory analysis is done to find out the best mix in producing this donut.

Review of Literature

2.1. Beet:

The beet, Beta vulgaris is a plant in the Chenopodiaceae family. It is best known in its numerous cultivated varieties, the most well-known of which is the purple root vegetable known as beetroot or table garden beet. However, other cultivated strains include the leafy vegetables chard and spinach beets, as well as the root vegetable sugar beet, which is important in sugar production. Beetroot can be eaten raw, used for juice extraction, baked or boiled. Red beets are delicious roasted, pickled, eaten in salads, or made into soup, which is popular in many Eastern and Central European countries. In contrast to fruits, the main sugar in beetroot is sucrose.

Beets have been used in traditional medicine for hundreds of years to treat constipation, gut and joint pain, dandruff. Modern pharmacology shows that red beet extracts exhibit antihypertensive and hypoglycemic activity as well as excellent antioxidant activity. The promising results of their phytochemicals in health protection suggest the opportunity for their use in functional foods

2.1.1.The chemical composition and nutritional value of Beet:

This review includes description of beetroot phytochemicals with the greatest functional importance.

Proximate nutritive values of red beetroot are as follows: vitamin A—20 I.U ,.thiamine—0.02 mg, riboflavin—0.05 mg, niacin—0.4mg, vitamin C—10 mg ,calcium—27 mg, iron—1.0 mg, phosphorus—43 mg, total fiber 87.4 g , fat—1 g,carbohydrates—9.6 g, protein—1.6 g, calories—42 kcal per 100 g. Not only does the beet root have nutritional value, its leaves also do, but they are eaten unreasonably rarely. However, the uniqueness of red beets does not lie in their nutritional value. 100 g of this plant contains: alkaloids (128.8 mg), steroids (16.4 mg) ,glycosides (0.652 mg), flavonoids (6.15 mg), terpenoids (115.5mg) , saponins (3.789mg), beta-carotene (11.64 mg), vitamins A (2.6 mcg), K (3.2 mcg), C (4.36 mg), E (0.18 mg), B3 (0.03 mg), B6 (90 mg), B2 (0.034 mg), pantothenic acid0.151 mg), potassium (20 mg), iron (0.76 mg).Sometimes it is necessary to take into account beet root as reducing nutritional value due to its high level of oxalic acid. Nevertheless, functionally the most important red beetroot phytochemicals, which provide benefits beyond normal health maintenance, are secondary metabolites betalains, betaine and nitrates.

Betalains are unique nitrogen-containing pigments found exclusively in families of Caryophyllales order and some higher order fungi, where they replace anthocyanin pigments. Beta vulgaris betalains include two classes of compounds: betacyanins, which are red violet and betaxanthins (predominantly , vulgaxanthin-I), which are yellow. The major betalain in red beet is betanin ,which is betanidin-5-O-beta-glucoside, containing phenolic and cyclic amine groups, acting as antioxidants. Betanin, the major betalain in red beetroot, showed poor bioavailability.

Commonly betalains are used as food colorants .The five examined Beta vulgaris cultivars from Hungary showed no significant differences in the content of redviolet pigments .However, studying commercial beetroot products and beetroot juice prepared from seven red beet varieties grown in Upper Austria, it was found, that total betalain content is variety specific. In comparison to other vegetables, the antioxidant capacity of beets is very high. A highly significant correlation was demonstrated between antioxidant capacity and the contents of red pigments, whereas a remarkably less tangible relationship was found between antioxidant capacity and content of yellow pigments. Betalain's other biological effects are uncertain.

Betaine (trimethylglycine) is found naturally in most living organisms and rich dietary sources include seafood, especially marine invertebrates (≈1%) ,wheat germ or bran (≈1%) and spinach (≈0.75%). The total content of betaine in red beet juice is 0.3% - 0.4%. The principal physiological role of betaine is an osmolyte and methyl donor (trans methylation). As an osmolyte, betaine protects cells, proteins, and enzymes from environmental stress (dehydration, extreme temperature etc.). Inadequate dietary intake of betaine (the donor of methyl groups) leads to hypo-methylation in many important pathways, including disturbed hepatic protein (methionine) metabolism as determined by elevated blood homocysteine and inadequate hepatic fat metabolism, which leads to steatosis and plasma dyslipidemia. These alterations may contribute to various diseases, predominantly cardiovascular ones. Betaine has the principal role in lowering the blood level of homocysteine, which

is the key element in cascading development of atherosclerosis.The history of the study of biological activity of nitrates in the context of red beet health effects represents an excellent example of how radically our understanding of food utility can be changed. It was long considered that nitrates are a harmful substance contaminating vegetables. Nitrates can be converted in to nitrosamines which could lead to endocrinological diseases, defects in human fetuses, as well as cancer genesis etc. However, at present time the red beet nitrates are considered as one of the most important nutrients (about it see below). Speaking of chemical composition of Beta vulgaris one of the compounds , which content in beet root is high and it can cause side effect, should be mentioned. It is oxalic acid. Red beet belongs to oxalate-accumulating plants Therefore, regular consumption of red beet is contraindicated for people with urolithiasis.

2.2. Mint:

Mentha piperita L. or peppermint with vernacular name of "nana felfeli", a plant from Labiatae family is traditionally used as antiseptic, stimulant, carminative agent or is used as flavoring agent in cosmetic and pharmaceutical industries throughout the world. According to its antiseptic activities, there are some investigations on its antimicrobial activities. The peppermint essential oil and its ethanol extract exhibited antifungal activity against Candida albicans, C. tropicalis, C. glabrata and C. parasilosis, but its infusion did not have any antifungal activity **(Carretto et al. 2010).** Peppermint oil showed good antimicrobial activity against Aspergilus Niger, Rhizopus solani and Alternaria alternate **(Hussain et al. 2010),** Pseudomonas syringe, Xanthamonas campestris, Escherichia coli, Pseudomonas aeruginosa and Salmonella typhimurium **(Iscan et al. 2002).** The antibacterial activity of peppermint leave's juice against Gram negative bacilli was higher than that of its stem juice **(Saeed and Tariq, 2005).** The antimicrobial activity of peppermint oil against C. albicans and E. coli was higher than that of S. aureus. This oil had good antioxidant activity in two systems of DPPH free radical scavenging and β- carotene/linoleic acid systems **(Yadegarinia et al. 2006).** Other pharmacological activity such as antiviral activity against Influenza, Herpes and other viruses **(Kerman and Kucera, 1967)** and its antihelmentic effect is confirmed, The

antihelmintic effect of peppermint methanol extract is comparable with Albendazole with mechanism of paralysis and death of worms **(Girme et al. 2006).** Because of difference in chemical composition of peppermint essential oil from different part of world, we analyzed the chemical composition of peppermint oil and its antimicrobial effect against a large number of microorganisms, and its synergistic 4 effects with vancomycin, gentamycin and amphotericin B against Staphylococcus aureus, E. coli, Candida albicans and Aspergilus Niger, respectively.

.2.21.The chemical composition and nutritional value of Mint:

Forty three components were identified in peppermint oil accounting for 99.8% of total oil. Menthol (36.9%), menthone (28.8%) and methyl acetate (4.5%) were the main components of peppermint oil followed by carveone (3.8%), neomenthol (3.8%), 1,8- cineole (3.8%) and limonene (3.29%).

Mint is known for its refreshing aroma and cool feel. Mint leaves are a great source of Vitamin C, A and E as well as beta carotene. Chewing leaves of mint freshen breath and offers micronutrients such as calcium, potassium, magnesium, iron, dietary fiber and manganese. Essential oils are loaded with antioxidants which helps to promote immune system in the body. It is free from cholesterol.

Menthol or Mint oil which is extracted from the herb is used as flavoring agents in mouthwashes, toothpastes, mouth fresheners and chewing gums. It is used in oral care products and also used

in shampoos, soaps and oils for massage or aromatherapy. Mint extracts are used to provide relief from stomach upsets, nasal congestion, headache, colic and gingivitis

Respiratory health:

The study explored the effect of inhalation of C.sinesis and Mentha spicata essential oils on exercise performance as well as lung function. The findings support effectiveness of C.sinesis and M.spicata essential oils on the parameters of exercise performance and respiratory function. Due to small sample size and lack of control groups, masking or randomization, our generalizability and conclusion of results should be interpreted with caution. A further investigation is recommended in order to explain mechanism of actions for these two essential oils on exercise performance and respiratory gas exchange parameters. Instead of inhalation of peppermint aroma, differences in running distance, duration of study and inhalation of two different unstudied before essential oils could be a vital characteristic of this study in comparison to previous researches.

Digestive health

Mint is a palate cleanser or a great appetizer. It enhances digestion and soothes stomach in the case of inflammation or indigestion. Drink a cup of mint tea to provide relief from stomach problems. Menthol oil extracted from mint is helpful for those who travel long distances by boat or plane for motion sickness and nausea. The aroma found in this herb activates salivary glands in mouth

and glands that secretes digestive enzymes by facilitating digestion.

Treatment for headache and nausea

Crushed leaves are helpful to treat nausea and headache. Mint has strong and refreshing aroma which is an aid for nausea. Mint oil or product having mint helps to alleviate stomach issues. Rub the balms with basic mint oil or mint base on nose and forehead to provide relief from headache. It is a natural soothes that alleviates inflammation and lower the temperature during migraines and headaches

Treatment for Asthma

Being a good relaxant, Mint is beneficial for asthmatic patients by providing relief from congestion. Excessive use of mint could irritate nose and throat.

Lowers fatigue

It is a natural stimulant which helps to charge energy and brain functions at higher level. The essential oil might be helpful if one is feeling anxious, sluggish, exhausted or depressed. It could be applied topically, ingested and inhaled as vapor. For best results, put few drops of mint essential oil on pillow at night.

Skin care

Mint oil is an antipruritic and antiseptic. Mint juice acts as a great skin cleanser. It soothes skin and cures infections as well as itchiness. Moreover, it helps to reduce pimples by providing relief

from acne symptoms. It has anti-pruritic properties which help to treat insect bites of honeybees, mosquitoes, wasps, hornets and gnats. It has cooling sensation which provides relief from irritation, urge to scratch and due to its anti-inflammatory properties, it lowers the swelling. Mint oil is used in bug repellent products such as citronella candles.

Promote cognition

The study evaluated the effects of mint on retention, alertness and cognitive function. People who use chewing gum having mint as an active ingredient has high levels of memory retention and mental alertness in comparison to those who did not. Mint has stimulant qualities.

Lose in weight

Mint assist in losing weight in a healthy way. It is a stimulant which stimulated digestive enzymes which absorb nutrients from food and consume fat which is turned into usable energy. Add mint to the diet for turning the high amount of fat into use that being stored that contributes to weight gain.

Sterility improvement

There are mixed opinions regarding this treatment with mint. Some say that use of menthol for prolonged time causes sterility lowering the ability of woman to conceive by interfering with ova production and eliminating these gametes. It is due to its insecticidal and germicidal properties of herb which is helpful for health. Another research shows that the men who smoke menthol

cigarettes are prone to suffer from impotence than those who smoke normal cigarettes. Other group suggest that Mint is used for treating sterility in females. Research must be conducted on effects of mint in both female sterility and male impotency.

Oral health

Mint possesses germicidal properties which help to freshen breath quickly. It inhibits growth of harmful bacteria inside mouth and cleans tongue and teeth. Rub mint directly on teeth and gums for refreshing mouth and kill harmful growth of bacteria. Mint is used as a common element in mouthwashes, toothpastes and other dental hygiene products.

Cure hay fever and allergies

Hay fever and seasonal allergies affects about millions of people in the world. Mint leaves extract helps to inhibit release of some chemicals that aggravate severe nasal symptoms related with seasonal allergies and hay fever.

Cancer prevention

Studies show that daily intake of mint lowers the chances of cancer. It has cancer counteracting properties due to the presence of carotenoids and beta carotenoids found in mint. Carotenoids help to increase cell differential and protects cells against carcinogenic chemicals which could damage DNA. Vitamin A has anti-carcinogenic properties which are found in abundant amounts in mint that helps to prevent formation of tumor and cell proliferation.

2.3. Nescafe:

The beginnings of Nescafe can be traced back to 1930, when the Brazilian government first approached Nestle. At that time Brazil had a huge coffee surplus and it was felt that coffee consumption would increase if a new product were developed. While there were some forms of crystallized or liquid in the market, they were not readily soluble and tasted horrible. The Brazilian Coffee Institute approached Nestlé's chairman and asked to develop coffee that would be soluble in hot water but would retain its original flavor. Our coffee guru, Mar Mergenthaler. and his team set out immediately to find a way of developing a quality, cup of coffee that could be made simply by adding hot water, yet would retain the coffee's natural flavor. After seven long years of painstaking research at the Nestle research Centre laboratory in Switzerland, the scientist Max Mergenthaler finally found the answer. On April 1st 1938 Nescafe was first launclied in Switzerland. The new product was named Nescafe - a combination of Nestle and café.

2.3.1.The chemical composition and nutritional value of Nescafe:

Table(3) Nutritional and chemical Information:

Carbohydrate Per 100g (g)	**3.1 g**
Carbohydrate of which Sugars per 100g (g)	3.1 g
Fat per 100g (g)	0.2 g
Fat of which Saturates per 100g (g)	0.1 g
Energy per 100g (kcal)	118 kcal
Energy per 100g (kJ)	484 kJ
Protein per 100g (g)	7.8 g
Salt per 100g (g)	0.25 g

The potential health benefits Trusted Source associated with drinking coffee include:

- protection against type 2 diabetes, Parkinson's disease, liver disease, and liver cancer
- the promotion of a healthy heart.

In the sections below, we cover these benefits in more detail.

Coffee and diabetes

Coffee may help protect against type 2 diabetes.

In 2014, researchers who gathered data on over 48,000 people found that those who increased their coffee consumption by at least one cup per day over 4 years had an 11% lower risk of type 2 diabetes than those who did not increase their intake.

A meta-analysis Trusted Source from 2017 concluded that people who drank four to six cups of either caffeinated or decaffeinated

coffee each day appeared to have a lower risk of metabolic syndrome, including type 2 diabetes.

Coffee and Parkinson's disease

Various studies have shown that caffeine, which is present in coffee and many other beverages, may help protect against Parkinson's disease. One team concluded that men who drink over four cups of coffee per day might have a fivefold lower risk of Parkinson's than those who do not. In addition, the caffeine in coffee may help control movement in people with Parkinson's, according to one 2012 study. The findings of a 2017 meta-analysis suggested a link between coffee consumption and a lower risk of Parkinson's disease, even among people who smoke. This team also found that people who drink coffee may be less likely to experience depression and cognitive conditions such as Alzheimer's. There was not enough evidence Trusted Source to prove that drinking decaffeinated coffee would help prevent Parkinson's disease, however.

Coffee and liver cancer

Italian researchers found that coffee consumption lowers the risk of liver cancer by around 40%. Some of the results suggest that people who drink three cups per day might have a 50% lower risk.

Also, a 2019 literature review Trusted Source concluded that "coffee intake probably reduce the risk of liver cancer."

Coffee and other liver diseases

A meta-analysis Trusted Source from 2017 concluded that consuming any type of coffee appeared to reduce the risk of liver cancer, nonalcoholic fatty liver disease, and cirrhosis. People who consume coffee may also have a lower risk of gallstone disease. In 2014, researchers looked at coffee consumption among people with primary sclerosing cholangitis (PSC) and primary biliary cirrhosis (PBC). These are autoimmune conditions that affect the bile ducts in the liver. They found that people with PSC were more likely Trusted Source to have a lower coffee intake than those without the condition. There was no evidence to suggest that coffee intake was different among people with or without PBC. Also, one 2014 study suggested a link between coffee consumption and a lower risk of dying from nonviral hepatitis-related cirrhosis. The researchers suggested that drinking two or more cups of coffee every day might reduce the risk by 66%.

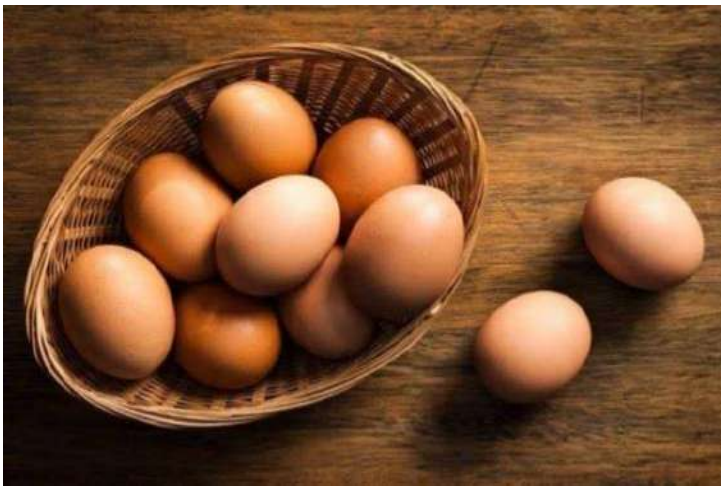
Coffee and heart health

One 2012 study concluded that drinking coffee in moderation, or consuming around two 8-ounce servings per day, may protect against heart failure.

People who drank moderate amounts of coffee each day had an 11% lower risk of heart failure than those who did not.

One 2017 meta-analysis Trusted Source found that caffeine consumption may have at least a small benefit for cardiovascular health, including blood pressure.

2.4.Egg:



Eggs are important sources of human food- man has been able to eat the eggs of many different animal species for thousands of years ,including birds, reptiles, amphibians and fish. Birds and reptiles are made up of a protective shell, containing albumin (white egg) hand egg whites (egg yolk) inside different thin membranes. Chicken eggs, ducks, shrimps, chicks and caviar are the favorite eggs of many humans, but chicken eggs are the most consumed eggs by humans. The good taste of eggs and its many uses in the preparation of different types of food has led to increased consumption of eggs in the world year after year **(Montagne.,2001).**

2.4.1.The chemical composition and nutritional value of egg:

1-5.3 g of unsaturated fat

6 grams of protein.

212 grams of cholesterol useful for C

8 International units of vitamin D

4.4 mg of iron

1.6 g saturated fat

1183 IU of vitamin A

129 mg of calcium

610 mg of choline

-Helps strengthen the immune system, helping to fight diseases caused by bacteria and viruses.

-Egg helps to prevent cancer, as it prevents the development of cancer cells for tumors such as colon and breast cancer.

-Eggs contain fatty acids that have innumerable benefits, as they increase the beneficial cholesterol in the body, strengthen memory and prevent Alzheimer's disease.

-Eggs are essential elements of eye health, namely lutein and zeaxanthin, which are important in the prevention of multiple diseases ,such as retinal atrophy.

-Helps cure anemia.

-Eating eggs helps prevent heart attacks and strokes Promotes the health of the nervous system.

-Provides the body with the necessary energy.

-Eggs maintain the health of bones and teeth, because it contains elements such as calcium and vitamin D.

2.5. Butter milk:

Naturally fermented buttermilk, prepared from soured cream or milk . Widely differing concentrations of organic acids and volatile compounds among samples indicated variable fermentation in the products. This indicates the need for the introduction of the standardization of the process to supply the market with homogenous buttermilk products. **(Lindmark-Mansson et al.,2003).**

2.5.1.The chemical composition and nutritional value of butter milk:

Table (1)Composition and Physiochemical Properties of Sweet Cream Buttermilk and Skim Milk: **(Berkey et al.,2019)**

Characteristic	Skim Milk	Sweet Cream Butter milk
T.S.(%)	10.38	9.88
Fat (%)	0.09	0.59
Total Proteins (%)	4.27	3.73
Lactose (%)	5.2	4.81
Ash (%)	0.82	0.75
Total Phospholipids(mg%)	8.65	78.56
PH	6.69	6.86

Titratable acidity 9%LA)	0.16	0.12
Relative viscosity	1.64	1.80

Buttermilk is low on fats and calories. Being a good source of calcium and vitamins, it can included in the diet on a regular basis. Along with calcium, buttermilk is also high on proteins and the major part of energy comes from the carbohydrates present in it. Buttermilk contains good bacteria called The Lactic acid bacteria which helps in improving the immunity of the body. A cup of buttermilk contains only 2.2g of fat and 99 calories. Buttermilk is rich in potassium, vitamin B-12 , calcium, phosphorous and probiotics which is essential for the body. It is also rich in Vitamins E and K and Vitamin A along with selenium. **(Berkey et al .,2009).**

(Siri-Tarino et al ., (2010) mintion that digestive problems are often advised to drink buttermilk rather than milk, as it is more quickly and easily digested. Buttermilk has more lactic acid than skim milk. Buttermilk made at home is a rich source of probiotics. Like yogurt or kefir, buttermilk that contains active cultures can help build healthy bacteria in the stomach that may have been lost due to taking antibiotics. These healthy bacteria enhance digestion, aid in nutrition, and combat digestive issues from flatulence to Crohn's disease. Those suffering from indigestion or reflux may find that the richness of buttermilk soothes an inflamed esophagus. . It even helps you wash down oily foods and makes sure you do not feel stuffed. It even clears the lining of our stomachs and food pipe. Buttermilk has been found

to help with conditions like lactose intolerance, colon cancer, and stomach infections.

Also-others illustrated that one of buttermilk's greatest benefits is its calcium content. You need 1,000 milligrams of calcium daily, and each cup of low-fat buttermilk gives you 284 milligrams, just over a quarter of your goal. Getting ample calcium in your diet may help slow bone loss as you age, may help support new bone growth, and may stave off osteoporosis. Calcium is also known to support cell communication and muscle contraction..

Bendtsen ,(2013) studed that Protein is especially important for strong bones, muscles, and skin health. One cup of buttermilk has8. 1 grams of protein, which is about the same as one cup of low-fat milk. for those watching their caloric or fat intake, you can try putting a couple of tablespoons of buttermilk on your baked potato or in mashed potatoes as a substitution for sour cream or butter. You will get both the buttery flavor and the slight tang of sour cream with a fraction of the calories. You can also make a sour cream substitute using buttermilk powder.

Also, he mintion that buttermilk packs plenty of minerals and vitamins that your body needs to stay strong. It is a natural supplement that can help keep healthy and make sure you never go low on most of your nutrients. It is not just a rich source of calcium and protein but also contains other nutrients like iron, potassium, phosphorus, sodium, and zincalong with vitamins A, D, E, and B. Buttermilk is one of the best summer drinks that you can

get as, not only does the drink cools down your body, but it also helps get rid of general uneasiness.

It is very important to keep your calcium levels on the positive side, but it is not so easy for everyone. Proper intake can help you avoid serious problems like osteoporosis and even help you deal with arthritis. Buttermilk provides you with the calcium and other nutrients without the fat. Buttermilk contains riboflavin that helps your liver to function.

properly and detoxify the body. It is also an anti oxidizing agent and is vital for the release of hormones that aid in the digestion process. **(Bendtsen , 2013).**

It is very important to have regulated blood pressure to avoid major heart problems and stroke. It contains an abundance of bioactive proteins that help in lowering your cholesterol levels. These components are also anti-bacterial and antiviral. Regularly drinking the beverage can help lower your blood pressure, quite significantly.

Buttermilk has very low-fat content and is rich with other beneficial nutrients. If you drink it regularly, you can avoid dehydration and remain energetic, even when you are on a diet. It can help satisfy hunger so that you stay away from unhealthy junk foods. The probiotic present in buttermilk can keep the ecosystem balanced so that harmful microorganisms cannot come from in the area. Buttermilk has an abundance of calcium, which means it can keep your bones strong. It is a very good way to avoid osteoporosis if you are lactose intolerant. It doesn't just maintain

bone density but also provides nourishment to other organs in your body.

Buttermilk can be used in masks and or as a facial cleanser to deal with the effects of sunlight. Moreover, people also use it as an anti-aging product. There are numerous buttermilk mask recipes that you can find online, through a simple search, if you want to improve your skin. The bacterium present in buttermilk empowers the immune system and helps you avoid various diseases. It is a great way of fending off vaginal infection as it is a probiotic. Moreover, it takes care of your heart due to its low-fat content and even keeps your blood pressure in check. According to a research, regular consumption of buttermilk can ward off candida infections in diabetic women. **(Bendtsen ,2013).**

2.6.Milk:

Dairy and milk consumption are frequently included as important elements in a healthy and balanced diet. It is the first food for mammals and provides all the necessary energy and nutrients to ensure proper growth and development, being crucial in respect to bone mass formation. Review of literature The nutritional importance of milk in the human diet and reinforce the possible role of its consumption in preventing several chronic conditions like cardiovascular diseases (CVDs), some forms of cancer, obesity, and diabetes. **(Haug et al ., 2007)**.

2.6.1. The chemical composition and nutritional value of milk:

On average, bovine milk is composed of water, to lactose, protein, to fat, minerals, and vitamins **.**
(Lindmark-Mansson et al .,2003).

Milk is generally considered an important protein source in the human diet, supplying approximately g protein/L.
(Severin et al ., 2005). Both are classified as high-quality proteins considering human amino acid requirements, digestibility, and bioavailability. In fact, milk proteins are frequently considered the best protein source taking in to account

the essential amino acid score and protein-digestibility corrected amino acid

score **(Schaafsma et al ., 2000).** The amino acid profile is quite different between the two fractions: Whey is especially rich in branched chain amino acids, i.e., Lucien, isoleucine, and valine as well as lysine, whereas casein has a higher proportion of histidine, methionine, and phenylalanine**. (Tan et al .,2009).**

Apart from the high-quality and biological value, milk proteins and several bioactive peptides resulting from their enzymatic hydrolysis have shown multiple biological roles that could exert a protective action in human health. These main biological actions include antibacterial ,antiviral, antifungal, antioxidant, antihypertensive, antimicrobial ,antithrombotic, opioid, and immunomodulatory roles, in addition to improving absorption of other nutrients. **(Mills et al .,2001).**

Fat fraction in milk is mainly present in globules that are resistant to pancreatic lipolysis unless they are first submitted to gastric digestion . Triacylglycerol (TAG) forms 98% of milk fat fraction, whereas other lipids like diacylglycerol (2%), cholesterol(<0.5%), phospholipids (w1%), and free fatty acids (0.1%) also can be found. Milk fat is the most complex of all natural fats considering that more than400 different fatty acids form its TAGs **(Mansson ,2009).**

In the unsaturated fatty acid fraction, oleic acid is present in concentrations within24% to 35% , whereas polyunsaturated fatty acids constitute around2.3% of total fatty acids, with linoleic and a-linolenic accounting for1.6% and ,0.7% respectively. Milk

also includes trans-fatty acids like vaccine acid (2.7%) and conjugated linoleic acid (0.34%1.37%). **(Lindmark-Mansson et al .,2003) .**

Milk has been naturally recognized as a privileged calcium source but in its mineral fraction, several other elements can be distinguished such as phosphorus, magnesium, zinc, and selenium **(Gaucheron , 2011).** The vitamin fraction is composed by liposoluble vitamins A, D, and E and also by water-soluble B complex vitamins such as thiamine and riboflavin**.**

Mineral fraction. Calcium is naturally the macro element present in higher amounts in milk. The average concentration of calcium is1200 mg/L of milk . calcium can bind to whey proteins or inorganic forms of phosphate-forming salts.

(Little et al .,2004).

One L of milk supplies mg of magnesium, which corresponds to 29% of the dietary reference intake for this mineral

(Insel et al ., 2003).

Milk is also a good source of microelements like zinc and selenium One L of milk supplies 3to4 mg of zinc, Selenium is present in an average concentration of 30mg/L, **(IOM. ,2012).**

The milk vitamin profile includes liposoluble (A, D, E) and hydro soluble vitamins (B complex and vitamin C)

(Gaucheron .,2011) Vitamin A is especially important in growth, development, immunity, and eye health. Its content in milk depends mainly on fat amount, but also on factors like animal feed and season . Whole milk is generally considered a good vitamin A source, supplying around172 mg/ g.

(Miller et al.,2013).

vitamin D started to deserve more attention as a polyvalent micronutrient considering some attributed protective actions. Studies have suggested vitamin D has anticarcinogenic **(Mamede et al .,2011).**

Milk can surely be distinguished by its richness in B complex vitamins, providing 10%to 15% of the daily recommended intake for most people . These vitamins are important enzymatic cofactors and participate in several metabolic pathways **(Patel et al .,2013).**

Moderate dairy product consumption has been recommended as a healthy food habit suggested as part of a protective dietary pattern involved in the prevention of several chronic diseases, including cancer **(Park et al ., 2009).**

Results from the longest cohort study have shown that higher milk intake was associated with a reduced relative risk , which was confirmed by the most recent meta-analysis .

This protective effect may be due to milk's richness in calcium and magnesium, two minerals that have been found crucial in insulin sensitivity and glucose tolerance **(Elwood et al .,2007).**

Milk consumption has been previously associated with a higher bone density, which is protective . This effect could be attributed only to calcium, but there is considerable debate concerning the effect of calcium supplementation by itself in bone mass **(Cashman , 2002).**

2.7.Yeast:

Saccharomyces cerevisiae yeast is unicellular fungi that divide asexually by budding or fission and whose individual cell size with a large diameter of 5-10µm and a small diameter of 1-7µm. The cells of S. cerevisiae are pigmented, where cream color may be visualized in surface-grown colonies **(Walker and White, 2011).** Yeast cell is completely deferred than bacterial cell in both structure and function.

S. cerevisiae has an extensive history of uses in the area of food processing. It is commonly known as baker's yeast or brewer's yeast. S. cerevisiae has been used for centuries as leavening for bread and as a fermenter of alcoholic beverages and wine production. Yeast also has a new function as natural feed additives in ruminant and non-ruminant animals for manipulating the gastrointestinal tract and the rumen environment**.**

2.6.1. The chemical composition and nutritional value of yeast:

Table(2)Cellular composition of S. cerevisiae from a glucose limited anaerobic continuous culture **(adopted from Schulze, 1995)**

D=0.1	Cellular content %(w/w)
Protein	45.0
Glycogen	8.4
Trehalose	0.8
Mannan	13.1
Other carbohydrates	18.4
RNA	6.3
DNA	0.4
Free amino acids	1.1
Lipid	2.9
Ash	5.0
Sum	101.4

Yeast can naturally contribute significant amounts of numerous nutrients to bread and baked goods.

Vitamin D Phytosterols are natural plant sterols that have been shown to effectively lower blood cholesterol, enhance the immune system, and decrease the risk of certain cancers. The lowering of cholesterol is phytosterol's most documented health property. When exposed to UV light, ergosterol is converted to vitamin D. Apart from the prevention of the deficiency diseases rickets and osteomalacia, vitamin D is involved in maintaining calcium balance in the body, normal cell division and immune system function, a healthy inflammatory response, and normal muscle function.

Bakers yeast typically contains 0.5 percent (w/w) ergosterol, but selected strains can contain up to 1.5 percent ergosterol. The vitamin D level in yeast can be adjusted to any needs.

B VITAMINS Soluble in water, the B vitamins found in yeast are structurally dissimilar yet equally essential for normal cellular functions, growth, and development.

Thiamin (B1) acts as a coenzyme in a variety of critical metabolic reactions related to energy metabolism. B1 deficiency can lead to a variety produces carbon dioxide. This produces a spectrum of intermediate metabolites, many of which are precursors for flavor. Yeast fermentation products that can be detected both in dough and in the finished bread include ethanol and higher alcohols, aldehydes, and organic acids, which are by-products of the yeast's primary metabolic function in dough. Some of these by-products enhance the rate of browning reactions and the formation of melanoids and caramels in the bread crust. Important substrates for these types of reactions are sugars and amino acids. By contributing some of these substrates, the yeast also influences the eventual taste and flavor of the bread. of clinical abnormalities, including neurological and cardiovascular (heart failure) disorders.

Niacin (B3) is involved in glucose and fatty acid oxidation. It is one of the five vitamins that when lacking in human diet is associated with a pandemic deficiency disease called pellagra, which causes diarrhea, dermatitis, and dementia. Pantothenic acid (B5) is involved in fatty acid synthesis and degradation as well as in the synthesis of cholesterol, steroid hormones, heme, and acetylcholine. B5-deficiency symptoms are similar to those of other vitamin B deficiencies. Impaired energy production, due to low CoA levels, could cause irritability, fatigue, and apathy.

Foliate (B9) has a well-established role in the prevention of neurotubular birth defect (spina bifida). It also has a possible preventative role against cardiovascular disease, certain cancers, and neuropsychiatric conditions.

The minerals found in yeast are involved in growth, development, energy metabolism, and the reproductive system.

Potassium acts as an osmotic pressure regulator and is involved in the body acid–base balance and muscle contraction. Epidemiological studies indicate that diets high in potassium can reduce the risk of hypertension and possibly stroke.

Zinc is an important constituent of insulin and the DNA and RNA repair/enzyme function. It is involved in flavor perception and acts as vitamin A carrier. Symptoms of zinc deficiency include depressed growth, diarrhea, impotence and delayed sexual maturation, alopecia, and eye and skin lesions.

Proteins are the chief actors within the cell, said to be carrying out the duties specified by the information encoded in genes. The best-known role of proteins in the cell is as enzymes, which catalyze chemical reactions. Proteins have recently been recognized for their role in weight management and satiety. They represent more than 50 percent of yeast (w/w).

Dietary fibers play a role in maintaining normal intestinal function and stimulating the immune system. They are also known to act as prebiotic, improve insulin resistance, and reduce serum cholesterol. Yeast typically contains 30 to 40 percent (dry weight) fibers, of which 60% are beta-glucans.

Beta-glucans, polysaccharides found in yeast cell walls, have been shown to reduce blood cholesterol concentrations. Reports

have also been published on the immune benefits of yeast (Saccharomyces cerevisiae) beta-glucans.

Materials & Methods

MATERIALS AND METHODS

3.1. Materials

Wheat flour(72% extraction) - milk - liquid butter - eggs - sugar - salt - yeast- vanilla powder - beets - mint - Nescafé. All materials were purchased from Fathallah market El-Mansoura City -ElDakahlia Governorates. Egypt.

3.2. Methods:

preparation of donut from wheat flour (72% extraction) and its mixtures.

-The basic of donut making formula was as follows:

wheat flour 72% extraction (500 g) mixed with all ingredients (liquid butter- eggs- milk- sugar- salt- yeast- vanilla powder) (control sample) except beets, mint and Nescafé (control sample)

-First Ingredients for Beet donuts formula:

Wheat flour (500 g)-milk (60g) -beet juice(60ml) -liquid butter milk (30 g)- sugar (30g)-eggs (1)-vanilla powder(7g)-yeast(15g) and a pinch of salt.

-second Ingredients for Nescafé donuts formula:

Wheat flour (500 g)-milk (60g) -Nescafé (50g) -liquid butter milk (30 g)- sugar (30g)-eggs (1)-vanilla powder(7g)-yeast(15g) and a pinch of salt.

-Third Ingredients for mint donuts formula:

Wheat flour (500 g)-milk (60g) –mint juice (60g) -liquid butter

milk (30 g)- sugar (30g)-eggs (1)-vanilla powder(7g)-yeast(15g) and a pinch of salt.

The ingredients will be mixed for 10 min, then Leave the dough to rest for an hour ,then the formation, rest for half an hour and will fry in a lot of oil at 180° C . All donuts samples will be packing in polyethylene bays after cooling for investigation.

Organoleptic evaluation of Donuts sample: -

Beet donuts samples were evaluated organoleptically by panels pf 10 experienced panelists for; taste, odor, color of crust, c0lour of crumb, sponge and overall acceptability, according to the method described by **klien (1984)**.

Table(3): Organoleptic evaluation score of the prepared donuts samples:

Samples	Color (10)	Odor (10)	Taste (10)	Crumb (10)	Crust (10)	Appearance (10)	Total (100)
Control							
No (1)							
No(2)							
No (3)							

-Control sample: Donut prepared Wheat flour(72% extraction) - milk - liquid butter - eggs - sugar - salt - yeast- vanilla powder.

-Sample No(1): Donut with beet and all other ingredients.

-Sample No (2): Donut with Nescafe and all other ingredients.

-Sample No (3): Donut with mint and all other ingredients.

Results & Discussion

RESULTS AND DISCUSSION

Sensory evaluation of donuts:

All prepared donuts were evaluated by using taste, color, odor, crumb, crust, appearance with 20 students at food science and technology program at faculty of agriculture.

Table (4):

Samples	Color (10)	Odor (10)	Taste (10)	Crumb (10)	Crust (10)	Appearance (10)	Overall (60)	Total (100)
Control	9.65	10	10	10	10	9.9	59.55	99.25
No (1)	9.85	9.9	9.8	9.95	10	9.8	59.3	98.83
No(2)	9.75	9.5	9.25	9.35	9.45	9.85	57.15	95.25
No (3)	9.95	9.85	9.55	9.95	9.95	9.95	59.2	98.66

The results in table (4) showed that the highest score odor ,taste and crumb were (10) in control donut sample respectively while the lowest score was found in cake sample No(2) were (9.5) ,(9.25) and(9.35) respectively.

From the same table it noticed that the highest score of crust was (10) in cake sample control donut sample and No(1) respectively.

Also , results in the same table showed that donut sample No(1) had highest score in color , odor, taste , crumb, crust , appearance and overall acceptability were 9.85 ,9.9 ,9.8 ,9.95 , 10 ,9.8 and 59.3 respectively.

donut sample No(3) had 9.95 , 9.85 , 9.55 , 9.95 , 9.95 , 9.95 and 59.2 for color, odor ,taste ,crumb, crust ,appearance and overall acceptability (table 4).

So ,from data illustrated in table (4) , it can be seen that the score of color of all samples was 9.65 , 9.85 , 9.75 and 9.95 for control cake sample , cake sample No(1) , cake sample No(2) and cake sample No(3) respectively.

From the same table , it is noticeable that overall acceptability were 59.55 ,59.3 , 57.15 and 59.2 for control sample , cake sample No(1) ,

cake sample No(3) and cake sample No(2) respectively.

It is expected that the control sample is the highest in the total and the best in the qualities followed by other samples.

Also, it is expected that the results indicated that the sample prepared from beets are the best of components are the best samples after the control sample which have high nutritional value and good properties.

Fig (1) Control sample

Fig (2) control sample

Fig (3)

Fig (4)

Fig (5)

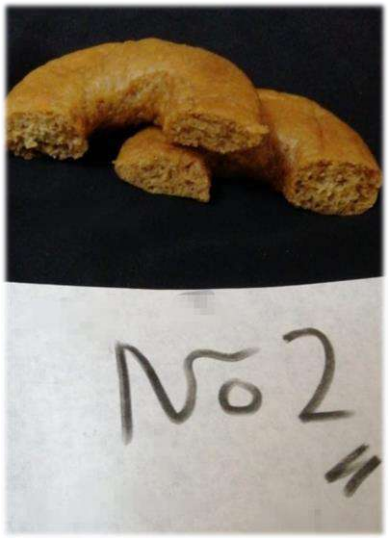


Fig (6)

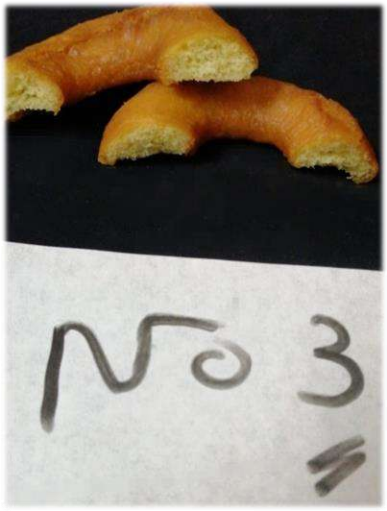


Fig (7)

Summary & Conclusion

Summary

This study was conducted for the purpose of producing a donuts with high nutritional value and palatable flavors. This will be done by adding beets, Nescafé and mint in donuts, which can be used for all groups because they are rich in nutrients.

It is expected that the donuts with beets is the high sample of nutritional value and has many nutritional functions.

A sensory evaluation of the samples of the resulting cake, both the control sample and the other samples, was done as follows :-

- The control sample, which was made from wheat flour, extracted 72% with the addition of liquid butter ,eggs, milk, sugar ,salt ,yeast and vanilla powder.

- Sample No (1) made from extracted72% and added wheat flour

For each of the ingredients in addition to the beets

- Sample No(2) made from extracted72% and added wheat flour

For each of the ingredients in addition to the Nescafe.

- Sample No(3) made from extracted72% and added wheat flour

For each of the ingredients in addition to the mint

The results of the sensory evaluation showed that the control sample was the best samples to obtain the highest values (99.25%) followed by the sample No(1) and processed from beet (98.83%) followed by the third sample manufactured from

No(3)(98.66%) and finally the sample No(2) manufactured from Nescafe.

The sample (1) is the high sample of nutritional value and has many nutritional functions.

These products are expected to meet a huge demand, according to the results ،The study and also because it contains an integrated and high group of benefits and high vitamins Nutritional value.

References

1. **A**hmed, M., Rauf, M., Mukhtar, Z. and Saeed, N.A. (2017) Excessive Use of Nitrogenous Fertilizers: An Unawareness Causing Serious Threats to Environment and Human Health. Environmental Science and Pollution Research, 24, 26983-26987. https://doi.org/10.1007/s11356-017-0589-7

2. **B**erkey CS, Colditz GA, Rockett HRH, Frazier AL, Willett WC,(2009). Dairy consumption and female height growth: prospective cohort study. Cancer Epidemiol. Biomarkers Prev;18:1881 –7.

3. **B**elch, G.E. and Belch, M.A., 2004, Advertising and Promotion: an Integrated Marketing communications Perspective, 6th Edition, TATA McGraw-Hill Publishing Co. Ltd., India.

4. **B**endtsen LQ, Lorenzen JK, Bendsen NT, Rasmussen C, Astrup A,(2013). Effect of dairy proteins on appetite, energy expenditure, body weight, and composition: a review of the evidence from controlled clinical trials. AdvNutr [Internet];4:418 –38. Available from: http://www.ncbi.nlm.nih.

5. **B**ehnam, S., Farzaneh, M., Ahmadzadeh, M. and Tehrani. A.S. 2006. Composition and antifungal activity of essential oils of Mentha piperita and Lavendula angustifolia on post-harvest phytopathogens. Communications in agricultural and applied biological sciences's 71(3 Pt B), 1321-6.

6. **B**igelis, R. 1985. Primary metabolism and industrial fermentations. In: J. W. Bennet, L. L. Lasure (Eds.),Gene Manipulations in Fungi. (pp. 357), New York, NY: Academic Press.

7. **B**ruinenberg, P. M., van Dijken, J. P. & Scheffers, W. A. (1983). A theoretical analysis of NADPH production and consumption in yeasts. Journal of General Microbiology 129, 953-964.

8. **C**arretto, C.F.P., Almeida, R.B.A., Furlan, M.R., Jorge, A.O.C. and Junqueira, J.C. 2010. Antimicrobial activity of Mentha piperita L. against Candida spp. Brazilian Dental Journal 13 (1), 4.

9. **C**ashman KD,(2002). Calcium intake, calcium bioavailability and bone health. Br J Nutr;87(Suppl2):S169 –77 .

10. **C**lifford, T., Constantinou, C.M., Keane, K.M., West, D.J., Howatson, G. and Stevenson, E.J. (2017) The Plasma Bioavailability of Nitrate and Betanin from Beta vulgaris Rubra in Humans. European Journal of Nutrition, 56, 1245-1254. https://doi.org/10.1007/s00394-016-1173-5

11. **C**orporate Affairs Department, Nestle Bangladesh Limited.

12. **C**osma, M. P. 2004. Daughter-specific repression of Saccharomyces cerevisiae HO: Ash1 is the commander. EMBO reports, 5, 921 – 1013. Herskowitz, I. 1988. Life cycle of the budding yeast Saccharomyces cerevisiae. Microbiolgy Reviews, 52: 536–53.

13. **C**osta, D.A., Stahl Hermes, V., de Oliveira Rios, A. and Hickmann Flores, S. (2017) Minimally Processed Beetroot Waste as an Alternative Source to Obtain Functional Ingredients. Journal of Food Science and Technology, 54, 2050-2058. https://doi.org/10.1007/s13197-017-2642-4.

14. **C**raig, S.A. (2004) Betaine in Human Nutrition. The American Journal of Clinical Nutrition, 80, 539-549. https://doi.org/10.1093/ajcn/80.3.539

15. **C**zapsk, J., Mikołajczyk, K. and Kaczmarek, M. (2009) Relationship between Antioxidant Capacity of Red Beet Juice and Contents of Its Betalain Pigments. Polish Journal of Food and Nutrition Sciences, 59, 119-122

16. **E**lwood PC, Pickering JE, Fehily AM,(2007). Milk and dairy consumption, diabetes and the metabolic syndrome: the Caerphilly prospective study. J Epidemiol Community Health;61:695 –8.

17. **F**arkas, V. (1989). Polysaccharide metabolism. In The Yeasts. Vol. 3. Metabolism and physiology of yeasts, pp. 317-366. Edited by A. H. Rose & J. S. Harrison. London: Academic Press.

18. **G**aucheron F,(2011). Milk and dairy products: a unique micronutrient combination. J Am CollNutr;30:400 S– 9S.

19. **G**asztonyi, M.N., Daood, H., Hájos, M.T. and Biacs, P. (2001) Comparison of Red Beet (Beta vulgaris var Conditiva) Varieties on the Basis of Their Pigment Components. Journal of the Science of

Food and Agriculture, 81, 932-933. https://doi.org/10.1002/jsfa.899

20. **G**irme, A.S., Bhalke, R.D., Ghogare, P.B., Tambe, R.S., Jadhav, R.S. and Nirma, S.A. 2006. Comparative In vitro anthelmintic activity of Mentha piperita and Lantana camara from Western India. The Dhaka University Journal of Pharmaceutical Sciences5(1-2),5-7.

21. **H**aug A, Høstmark AT, Harstad OM,(2007). Bovine milk in human nutrition– a review. Lipids Health Dis;6:1 – 16.

22. **H**amedi, S. and Honarvar, M. (2018) Beta vulgaris—A Mini-Review of Traditional Uses in Iran. Phyto-Chemistry and Pharmacology Current Drug Discovery Technologies, 15, 1.

23. **H**enry, S. A. Membrane lipids of yeast: biochemical and genetic studies. In the molecular biology of the yeast Saccharomyces: metabolism and gene expression, pp. 101-158. Edited by J. N. Strathern, E. W. Jones, & J. R. Broach. New York: Cold Spring Harbor.

24. **H**ussain, A.I., Anwar, F., Nigam, P.S., Ashraf, M. and Gilani, A.H. 2010. Seasonal variation in content, chemical composition and antimicrobial and cytotoxic activities of essential oils from four Mentha species. Journal of the Science of Food and Agriculture 90, 1827-1836.

25. **I**nsel P, Turner E, Ross D,(2003). Nutrition. 2nd ed. Sudbury, MA: Jones and Bartlett Publishers;.

26. **I**şcan, G., Kirimer, N., Kürkcüoğlu, M., Başer, K.H. and Demirci, F. 2002. Antimicrobial Screening of Mentha piperita Essential Oils. Journal of Agricultural and Food Chemistry 50, 3943-3946.

27. **K**anner, J., Harel, S. and Granit R. (2001) Betalains—A New Class of Dietary Cationized Antioxidants. Journal of Agricultural and Food Chemistry, 49, 5178-5185. https://doi.org/10.1021/jf010456f

28. **K**elberg, E. P. 2005. HIM1, a new yeast Saccharomyces cerevisiae gene playing a role in control of spontaneous and induced mutagenesis.Mutat Research, 578, 64-78.

29. **K**erman, E. and Kucera, L. 1967. Antiviral substances in plants of the mint family. Peppermint and other mint plants. Proceedings of the Society for Experimental Biology and Medicine 124, 874-875.

30. **K**otter.P.,2003, Marketing Management, 11th Editlon, Pearson Education Ltd., India.

31. **L**ittle EM, Holt C,(2004). An equilibrium thermodynamic model of the sequestration of calcium phosphate by casein phosphopeptides .EurBiophys J; 33:435– 45.

32. **L**indmark-Mansson H, Fonden R, Pettersson H-E,(2003). Composition of Swedish dairy milk.Int Dairy J;13:409 – 25.

33. **L**odish, H., Berk, A., Zipursky, S. L., Matsudaira, P., Baltimore, D., and Darnell, J. 2000.Mutations: Types and Causes. In: W. H. Freeman, Molecular Cell Biology. New York: Available from: http://www.ncbi.nlm.nih.gov/ books/NBK21578/.

34. **M**amede AC, Tavares SD, Abrantes AM, Trindade J, Maia JM, Botelho MF,(2011). The role of vitamins in cancer: a review. Nutr Cancer Routledge;63:479–97 .

35. **M**ansson HL,(2008). Fatty acids in bovine milk fat. Food Nutr Res;52 .

36. **M**arketing Department, Nestle Bangladesh Limited.

37. **M**illar, C. B. and Grunstein, M. 2006. Genome-wide patterns of histone modifications in yeast. Nature Reviews Molecular Cell Biology, 7, 657-666.

38. **M**iller BDD, Welch RM,(2013). Food system strategies for preventing micronutrient malnutrition. Food Policy;42:115 –28 .

39. **M**ills S, Ross RP, Hill C, Fitzgerald GF, Stanton C,(2011). Milk intelligence: Mining milk for bioactive substances associated with human health. Int Dairy J [Internet];21:377 – 401. Available from: http://linkinghub.elsevier.
com/retrieve/pii/S0958694611000021.

40. **M**oss,p.,1993, The Oxford History Project, oxford university Press. Hong Kong.

41. **N**ewbold, C. J., and Rode, L. M. 2006.Dietary additives to control methanogenesis in the rumen. International Congress Series, 1293, 138–147.

42. **N**uss, R.F. and Loewus, F.A. (1978) Further Studies on Oxalic Acid Biosynthesis in Oxalate-Accumulating Plants. Plant Physiology, 61, 590-592. https://doi.org/10.1104/pp.61.4.590

43. **O**doh, U.E. and Okoro, E.C. (2013) Quantitative Phytochemical, Proximate/Nutritive Composition Analysis of Beta vulgaris Linnaeus (Chenopodiaceae). International Journal of Current Research, 5, 3723-3728.

44. **O**ura, E. (1972) The effect of aeration on the growth energetics and biochemical composition of baker's yeast with appendix: reactions leading to the formation of yeast cell material from glucose and ethanol. Ph.D. thesis. Helsinki University, Helsinki, Finland.

45. **P**ark Y, Leitzmann MF, Subar AF, Hollenbeck A, Schatzkin A,(2009). Dairy food, calcium, and risk of cancer in the NIH-AARP Diet and Health Study. Arch Intern Med;169:391 –401.

46. **P**atel A, Zhan Y,(2012). Vitamin d in cardiovascular disease. Int J Prev Med;3:664.

47. **R**atledge, C. & Evens, C. T. (1989). Lipids an their metabolism. In the Yeasts. Vol. 3. Metabolism and physiology of yeasts, pp. 367-455. Edited by A. H. Rose & J. S. Harrison. London: Academic Press.

48. **R**ahimi, P., Abedimanesh, S., Mesbah Namin, S.A. and Ostadrahimi, A. (2018) Betalains, the Nature-Inspired Pigments, in Health and Diseases. Critical Reviews in Food Science and Nutrition, 1-30.

49. **R**ivoira, L., Studzińska, S., Szultka-Młyńska, M., Bruzzoniti, M.C. and Buszewski, B. vulgaris Samples by Hydrophilic Interaction Liquid Chromatography-Tandem Mass Spectrometry. Analytical and Bioanalytical Chemistry, 409, 533-541. https://doi.org/10.1007/s00216-017-0461-0

50. **R**osini, G., Federici, F., Vaughn, A. E., and Martini, A. 1982. Systematics of the species of the yeast genus Saccharomyces associated with the fermentation industry. European Journal of Applied Microbiology and Biotechnology, 15, 188-193.

51. **S**aeed, S. and Tariq, P., 2005. Antibacterial activities of Mentha piperita, Pisum sativum and Momordica charantia. Pakistan Journal Botany 37(4), 997-1001.

52. **S**chaafsma G,(2000). Criteria and Significance of Dietary Protein Sources in Humans The Protein Digestibility – Corrected Amino Acid Score . J Nutr;130:1865 – 7.

53. **S**chulze, U. (1995) Anaerobic physiology of Saccharomyces cerevisiae. Ph.d. thesis, Technical University of Denmark.

54. **S**everin S, Wenshui X,(2005). Milk biologically active components as nutraceut- icals: review. Crit Rev Food SciNutr;45:645 – 56.

55. **S**oković, M.D., Vukojević, J., Marin, P.D., Brkić, D.D., Vajs, V. and Griensven, L.J.L.D. 2009. Chemical composition of essential oils of Thymus and Mentha species and their antifungal activities. Molecules, 14, 238-249.

56. **S**tewart, G. C., and Russell, I. 1985. The biology of Saccharomyces. In: A. L. Demain, N. A. Solomon, (Eds.), Biology of industrial organisms (pp. 511- 536). Menlo Park, California: Benjamin Cummins Publishers.

57. **T**ang JE, Moore DR, Kujbida GW, Tarnopolsky MA, Phillips SM,(2009). Ingestion of whey hydrolysate, casein, or soy protein isolate: effects on mixed muscle protein synthesis at rest and following resistance exercise in young men. J ApplPhysiol; 107:987– 92.

58. **U**grinović, K., Kmecl, V., Herak Ćustić, M. and Žnidarčič, D. (2012) Contents of Oxalic Acid, Nitrate and Reduced Nitrogen in Different Parts of Beetrot (Beta vulgaris var. Conditiva alef.) at Different Rates of Nitrogen Fertilization. African Journal of Agricultural Research, 20, 3066-3072.

59. **V**arma, A.; Palsson, B. O. Parametric sensitivity of stoichiometeric flux balance models applied to wildtype Escherichia coli metabolism. Biotechnol. Bioeng. 1995, 45, 69-79.

60. **V**aughan-Martini,A.; Martini, A. (1993) A taxonomic key for the genus Saccharomyces. System. Appl. Microbiol. 16, 113-119.

61. **V**erduyn, C. Physiology of yeasts in relation t biomass yields. Antonie Van Leeuwenhoek, 1991, 60:325-53.

62. **V**erduyn, C; Postma, E; Scheffers, WA; van Dijken, JP. Energetics of Saccharomyces cerevisiae in anaerobic glucose-limited chemostat cultures. Journal of General Microbiology, 1990 Mar, 136 (Pt 3):405-12.

63. Walker, G. M. 2009. Yeasts. In: M. Schaechter (Ed.) Desk Encyclopedia of Microbiology. (pp. 1174-1187) 2nd ed. London: Elsevier/Academic Press.

64. **W**alker, G. M., and White, N. A. 2011.Introduction to Fungal Physiology. In: Kavanagh, K. (ed), Fungi: Biology and Applications (pp. 1-36). West Sussex, UK: John Wiley and Sons Ltd.

65. **W**russ, J., Waldenberger, G., Huemer, S., Uygun, P., Lanzerstorfer, P., Müller, U., Höglinger, O. and Weghuber U. (2015) Compositional Characteristics of Commercial Beetroot Products and Beetroot Juice Prepared from Seven Beetroot Varieties Grown in Upper Austria. Journal of Food Composition and Analysis, 42, 45-55. https://doi.org/10.1016/j.jfca.2015.03.005.

66. **Y**adegarinia, D., Gachkar, L., Rezaei, MB., Taghizadeh, M., Alipoor Astaneh, S.H. and Rasooli, I. 2006. Biochemical activities of Iranian Mentha piperita L. and Myrtus communis L. essential oils. Phytochemistry 67, 1249-1255-9.

67. The Roles of Yeast in Baking, Nutrition, and Health, Practical technology from Lallemand Inc, SPECIAL EDITION Nutritional and Health Benefits of Yeast.

68. Th Mereddy, R., Chan, A., Fanning, K., Nirmal, N. and Sultanbawa, Y. (2017) Betalain Rich Functional Extract with Reduced Salts and Nitrate Content from Red Beetroot (Beta vulgaris L.) Using

Membrane Separation Technology. Food Chemistry, 215, 311-317. https://doi.org/10.1016/j.foodchem.2016.07.132e Product Development Process Product Levels' and theMarketing Mix of Nescafe-DHAKA UNIVERSITY JOURNAL-OF BUSINESS STUDIES-VOLUME XXVII NO. 2 DECEMBER 2006.

69. https://www.henderson-foodservice.com/nescafe-original-coffee-sticks-200.html.

70. https://www.healthbenefitstimes.com/mint/.

71. Coffee: Benefits, nutrition, and risks (medicalnewstoday.com).

72. https://www.practo.com/healthfeed/benefits-of-buttermilk-3833/post.

73. https://www.thespruceeats.com/buttermilk-health-benefits-1807503.

74. https://www.naturalfoodseries.com/12-benefits-buttermilk.

75. http://en.wikipedia.org/wiki/buttermilk.

الملخص العربي

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أجريت هذه الدراسة بغرض إنتاج دونات ذات قيمة غذائية عالية ونكهات لذيذة. يتم ذلك عن طريق إضافة كلا مما يلى : -

البنجر والنسكافيه والنعناع في الدونات ، والتي يمكن استخدامها لجميع الفئات لأنها غنية بالعناصر الغذائية.

من المتوقع أن تكون الدونات مع البنجر عينة عالية من القيمة الغذائية ولها العديد من الوظائف الغذائية.

تم عمل تقييم حسي لعينات العجينة الناتجة سواء العينة الضابطة أو العينات الأخرى على النحو التالى :

- العينة الضابطة المصنوعة من دقيق القمح المستخلص بنسبة 72٪ مع إضافة الزبدة السائلة والبيض والحليب والسكر والملح والخميرة ومسحوق الفانيليا .

-عينة رقم (1) مصنوعة من مستخلص القمح 72٪ ومضاف إليه دقيق القمح لكل من المكونات بالإضافة إلى البنجر.

- عينة رقم (2) مصنوعة من مستخلص القمح 72٪ ومضاف إليه دقيق القمح لكل من المكونات بالإضافة إلى النسكافيه.

- عينه رقم (3) مصنعة من مستخلص 72٪ مضاف اليها دقيق القمح لكل من المكونات بالإضافة إلى النعناع.

أظهرت نتائج التقييم الحسي أن العينة الضابطة كانت أفضل العينات للحصول على أعلى القيم (99.25٪) تليها العينة(1) رقم والمعالجة من البنجر (98.83٪) تليها العينة الثالثة المصنعة النعناع من رقم (3) (98.66٪) واخيرا العينة رقم (2) مصنعة .من النسكافيه.

والعينة (1) هي عينة عالية القيمة الغذائية ولها الكثير وظائف التغذية.

من المتوقع أن تلبي هذه المنتجات طلبًا كبيرًا ، وفقًا للنتائج الدراسة وأيضاً لاحتوائها على مجموعة متكاملة وعالية من الفوائد والفيتامينات العالية القيمة الغذائية.

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كلية الزراعة
قسم الصناعات الغذائية

إنتاج الدونات ذو القيمة الغذائية العالية

مشروع تخرج مقدم من الطالبات

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أسماء أحمد عبد الرازق حسين

(كجزء من المتطلبات للحصول على درجة البكالوريوس في العلوم الزراعية)
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مدرس الصناعات الغذائية

كلية الزراعة ـ جامعة المنصورة

2021

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