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Review Article

Effect of Fats and Oils on Different Properties of Flours Used in Bakery Products: A Review

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ABSTRACT

Bakery products are the type of food products that are being widely used all over. The fats and oils used in dough formation play an important role in affecting the properties of a bakery product and making it consumer acceptable. This review highlights dough making, functional properties of fats/oils and flour, the effect of different fats and oils on the properties of dough. The different research articles were summarized in this review to compare the best fats and oils that could be utilized in the preparation of dough which in turn gave an acceptable end product. According to this study, the dough introduced to different variety of fats as well as oils were tested and the properties were evaluated which was later compared to consider the best of all. The vegetable derived oils and fats could bring a better quality keeping in consideration of the health as well.

Keywords: Bakery flour; Fats and oils; Triglycerides

INTRODUCTION

A list of ingredients used in the baking industry performs a description of functions in the baked products. Flour, fats and oils, leavening agents are the major functional ingredients among them. Sometimes substitution of the ingredients can also be done. The texture, flavor of the finished product can be greatly altered by the varying proportion of ingredients. The amazing products which are made in the Bakery industry from different types of flour include cookies, bread, cakes, biscuits, pasta, chapatti, paratha, muffins, crackers, gruels and breakfast cereals. The demand for these ready to eat processed foods have been increasing because of the growing urbanization and modern lifestyle. These Bakery products are considered as the most important products having the ability to satisfy these requirements.

Flour is a powdery substance made by grinding raw grains or roots to make a different variety of products. Many different flours used in dough making are whole wheat flour, Bread flour, All-purpose flour, composite flour, white flour, rice flour and cake flour. All over the world wheat is the first food crop and it is the most abundant and important milling food raw material. Wheat or wheat flour is unique among all cereal grains because it can form the dough by wheat flour alone and exhibit the required rheological properties for the production of leavened bread.

Wheat based products contain carotenoids, tocopherols and natural antioxidants, amylase, ascorbic acid insignificant amount whereas Refined flour contains phenolic acid, ferulic acid, phytic acid, selenium and Vitamin E Amino acids and polypeptides are produced in dough by protein decomposition so that the nutritional value of the dough or products will increase.

Fats and oils are considered the most abundant lipids in nature. Fats and oils are the principal ingredient in dough making and are present relatively in high amounts. When fat is added to flour in bread making it acts as a plasticizer, gives softness, improves flavour and has antistaling properties. The addition of fats and oils to the wheat flour dough affects the counteraction of the aqueous gas interface. Some studies show that loaf volume of dough increased because of the insertion of fats and oils and some studies show that loaf volume increases due to the insertion of fats not because of oils. Compared to hydrogenate fat cookies containing liquid oil has a harder texture. The main difference between oils and fats are, fats are a mixture of triglycerides that is in the form of solids as it contains a high proportion of saturated fatty acids whereas the oils are the

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mixture of triglycerides which are liquid due to a high proportion of unsaturated fatty acids present in them.

In many baked products such as Biscuits and bread, fat plays a major and unique role in providing desirable texture, eating qualities and flavour to the products. The overall acceptability, end products and viscoelastic properties mainly depend on the amount and type of fat used. In dough, the shortening function is performed by fat. The potential of fats to weaken, lubricate or shorten the structure of food components to come up with desirable texture is called shortening. During mixing fat acts as a lubricant and prevent the formation of a gluten network in the dough. In the absence of shortening; flour protein, water or sugar solution would interact to create cohesive and extensible gluten. When fat surrounds the proteins and starch granules, continuity of protein and starch structure breaks isolating from water in the presence of shortening. Shortening stabilizes the air cells generated by mixing. Fat contributes to the plasticity of dough and interacts with other ingredients to produce mouth feel, texture and overall sensation of lubricity of product. Addition of fat results in shrinkage of dough during moulding. Substitution of liquid oil for fat causes a decrease in the stiffness of the dough. The dough which is made up of a high amount of fats or oils requires less water for the desired consistency.

FUNCTIONAL PROPERTIES

The functional properties of food are usually determined by the physical, chemical, and organoleptic properties that are present in the food. These properties tend to be very beneficial in the application of flours as they can improve the flour blend property and also in the formation of various food formulations.

Flour

Functional properties of food include solubility, frothing ability, absorption, water retention, emulsification, hydration (water binding), viscosity, foaming, solubility, gelation, cohesion, and adhesion. The size of particles, types of variety, and types of processing methods or unit operations affect the swelling capacity of flours.

Water absorption capacity can be considered as an important factor of protein in various food products like dough, soups, and baked products. It is also an important processing parameter implying viscosity and also has an effect on bulking and consistency of products as well as in baking applications.

The oil absorption capacity of flour is important because it not only improves the mouthfeel but also helps in retaining the flavour. The interaction between the variation in the ratio of gelling properties of different legume flour samples to the different constituents like carbohydrates, proteins, and lipids that constitute the legume may also play a significant role in functional properties. The value of emulsion stability depends on various factors like concentration, solubility and pH. Many food products, such as cake, coffee whiteners, and frozen sweets, rely on the protein's ability to improve the development and stabilisation of emulsions. The foam producing capacity of flours is mainly due to the surface active proteins present.

Fats and oils

Fats and oils are usually colourless, tasteless, and odourless and the characteristic colour, flavour, and taste of the flavour are imparted by the foreign substances that are soluble in lipids and get absorbed by them giving it a flavour or colour. For instance, the yellow colour of the butter is due to the pigment called carotene and the flavour comes from diacetyl and 3-hydroxy-2-butanone which are the two compounds imparted by the bacteria during ripening cream from where the butter is formed. The functional properties of fats are firmly associated with their triacylglycerol and fatty acids compositions. Fats and oils are comparatively lighter than water. They are considered as an excellent insulator for the body by slowing the loss of heat through the skin as they are poor conductors of electricity and heat. Fats and oils that come in contact with the moisture in the air at room temperature undergo hydrolysis and oxidation reactions that turn them rancid giving them an off odour. Rancidity is a common and a major concern in the food industry to overcome this antioxidants are added which suppress rancidity.

They contain double bonds which go through a hydrogenation and oxidation process. The hydrogenation process of vegetable fats or oils that produce a quality of both solid and liquid is considered an important process in the food industry. During the processing, the total of double bonds that are hydrogenated is managed to produce fats with soft and pliable constancy.

FATS

Fats that is in solid state as butter or in the liquid state as oil contributes to the moistness, tenderness, and soft mouthfeel to the cooked products. It also enhances the savour of other ingredients and contributes its flavour in the case of butter. A small volume of fat added to the dough helps the gluten to stretch and it yields a loaf with greater volume.

Milk fat is present in most dairy products such as butter, ghee, cheese, etc. It gives a better texture, flavour, and also a good amount of nutritional value to the product prepared. Vegetable fats are fat of vegetable or plant origin that is obtained from natural plants, seeds, or the hydrogenation of vegetable oil. Like animal fats, even vegetable fats contain mixtures of triglycerides. Animal fats are derived from animals that are solid at room temperature. They are majorly composed of triglycerides and saturated fats which are considered unhealthy fats. Usually, animal fat is obtained from pigs, hogs, cattle, etc. and some birds like duck, chicken, etc.,.

Addition of butter to the dough

Butter is one of the dairy products that are made of milching animal's milk. It is a yellowish white fat globule with solid emulsion, inorganic salts, and water that is produced by the churning of cream milk. It is a multiphase emulsion of fat globules, crystalline fat, and an aqueous phase dispersed in a continuous oil phase. There are different types of butter such as unsalted butter, salted butter, sweet cream butter, mildly acidified butter, sour cream butter, Cottage butter, Pasteurized butter, table butter, and white butter. Butter consists of

moisture, fat of milk, salt, and curd. A small quantity of phospholipids, enzymes, vitamins, fat, lactose, and acids are also present. It is rich in minerals such as calcium, potassium, and phosphorus. It also contents protein and carbohydrates in some amount. A 2015 study stated that consumption of a high amount of butter could cause "Hypercholesterolemia". The review study made in 2016 published the overall associations of butter with cardiovascular diseases, mortality, and diabetes. The rheological characteristics of butter are spreadability and hardness. These are conversely related parameters and are the two most important aspects of texture. They were considered as the two commonly measured sensory properties and they are also substantially influenced by the acceptability of the consumers.

The increased addition of butter content slightly increased the viscoelastic characteristic of the dough. This in turn could give an improvement to the baked product volume. It was due to the hydrophilic interaction or emulsion between fat and water leading to the trapping of gas bubbles during the mixing process. But as the butter content increased too high the viscoelastic properties decreased as it could grasp the carbon dioxide during the dough fermentation. The hydrophobic part of butter was found to be one of the polysaccharides that created a compound with free water in the dough. So, when the appropriate composition of butter was utilized in the dough some parts of free water did not organize emulsion formulation with butter. When excessive butter composition was used in the dough, surplus lipid molecules appeared as free molecules leading to the breakdown of the dough. Therefore the lipid starch complex formulation caused a decrease in the viscous property due to which the viscoelastic character of the dough also decreased.

The butter added to the flour will create stability in the dough and also helps to create a light and tender texture in the batter prepared. Butter also helps to retain gasses like carbon dioxide and steam that are released during the process of baking. Moisture content on the gluten free bread produced varied depending on the amount of butter applied. That is, the increase in the butter content decreased the moisture content of the bread surface. Considering the colour after baking, the higher the butter content added more is the heat transferring rate. This increase in the temperature also resulted in the Millard reaction giving a red appearance. Bread crust was increased due to the carotenoids present in the butter. This in turn improved the yellow colour of the bread crust.

Addition of vegetable shortenings to the dough

Shortenings are generally fats that are in the semi-solid form at ambient temperature and are used in the preparation of bakery food products. Vegetable shortening is usually made of hydrogenating vegetable oil such as soybean oil, palm oil, or cottonseed oil. Vegetable fats are considered to have higher smoke points than margarine. It has 100% fat content and zeroes cholesterol. It can extend the shelf-life of some bakery foods.

When vegetable fat was used instead of butter in the batter it inhibited the formation of tuff and long strands of gluten and gave a light texture to the dough. Vegetable shortening contains some small bubbles which are filled with nitrogen. This helps in the leavening of the dough. It also contains emulsifiers that help in stabilizing the gas filled bubbles and dissolves the fat present. In this study, the added vegetable fat gave a good fluffy texture to the cookies but lacked flavour. Adding half butter as well as vegetable shortening could help improve both flavours as well as give a better texture.

In a study, the effects of vegetable shortening and mixing time of the bread dough were studied. The addition of shortenings to the dough weakened it, as the optimal consistency was obtained at a short interval time. The vacuum mixed dough had higher densities irrespective of the amount of shortening added. But there was a significant effect of shortening as the density of the dough decreased eventually as there was an increase in the amount of shortening.

Whole chia flour was included in the preparation of cake along with the hydrogenated vegetable fat and evaluated for its nutritional and sensory qualities. The results of this study showed that there was a decrease in the colour and specific volume of the cake but the variation in the hydrogenated vegetable fat and whole chia flour at storage conditions maintained the moisture content. Eventually, the presence of the hydrogenated vegetable fat minimized the unfavourable effects of the flour on the firmness and specific volume of the end product.

Addition of margarine to the dough

Margarine is a substitute for butter which was developed by H. Mege-Mouries, a French Chemist. It is primarily made of vegetable fat/oils such as soybean oil, palm oil, canola oil, cottonseed oil, corn oil, olive oil, flaxseed oil, etc. so it contains unsaturated fats, polyunsaturated fats, and monosaturated fats, and these fats decrease low density lipoprotein (LDL), bad cholesterol when it is replaced for saturated fat keeping the heart healthy. Margarine with a low melting point is used to blend in baking as it gives a very versatile nature to the product.

The palm mild fraction was interesterified with edible beef tallow which was catalyzed with the help of sodium methoxide and was used as margarine had good results. They were mixed into the cake batter which improved the volume and also the structure and clear lifting properties of the batter. The firmness of the margarine had a greater influence on the air incorporation into the batter which in turn increased the batter density. The fat was also uniformly distributed which gave the product a homogeneous crumb structure.

Margarine was utilized in the preparation of Puff Pastry and its effect on the texture and colour was studied. The results explained that on storage the pastry was noticed to be harder as the margarine was in lower content and the fat leaked out during the heating process giving it a harder texture. Considering the product quality the margarine content pastry appeared to have better colour, appearance, and texture as well as product value due to the number of puffy layers formed while baking.

The margarine content in the product was increased the number of layers also increased in turn decreasing the moisture content of the product. This also increased the volume of the loaf. The baking loss was found to increase as the margarine content of puff pastry increased but as the number of layers of it increased the baking loss also decreased.

The quality and safety characteristics of bread made from frozen dough were studied. For fats and oils, they used Margarine (3%) as a shortening agent. As it was added to improve the dough handling, crumb appearance, and product flavour. It also improved the keeping quality, moisture less, and softness of the bread texture. It resulted in an increase in the volume of the loaf, lesser crispy crust, and provided with good storage quality of the bread.

Addition of Lard fat to the dough

Lard is the fat obtained from pork that is mainly pig or hog and it is usually used in cooking and baking as well. The use of lard fat is used only in specific dishes as it causes health issues. The rendering process is carried out for animal fats wherein the fats are heated at low flame to remove the non-fatty membranes. But the non-rendered animal fats have more flavours. Lard fat consists of saturated fats as well as unsaturated fats. They are oleic acids, linoleic acids, palmitic acid, stearic acid, and myristic acid.

A study was conducted to determine whether the fats and oils could affect the characteristics of the loaf. Although, fats enhance the flavour as well as increase the caloric value of the product. In this experiment, the white bread was baked using lard along with some distinct vegetable oils adding with two different surfactants and was contrasted to a lard based control containing no surfactant. The product prepared with lard and palm gave softer bread. The bread baked with vegetable oil along with lard produced bread with higher specific volume when compared to the bread prepared with soya oil but the bread quality was not up to the mark. This was improved by introducing surfactant comprising of mono and diglyceride and polysorbate 60. The plastic fats like lard, tallow, etc. were switched with vegetable oils because lard fat consists of 30% of solid fraction and the vegetable oil had liquid fraction which is to be replaced, that was 70%.

The lard fat which has solid triglycerides that provide plastic consistency is ideal for functionality in the bakery system. The main application of lard fat was in the pie crust as it contains high lubricity and low structure as they crystallize in the beta form because of the high melting di-saturated monosaturated (GS2U) triglycerides. The lard was slowly mixed in the dough so that they are not fully absorbed in the dough which forms a tougher, harder crust with more shrinkage.

To avoid the absorption of the fats into the dough colder dough was taken and this also showed plasticity at refrigerated temperature. The solids of the fat due to its beta crystalline habit it provided the dough with a desired lower temperature plasticity which gave the product a flaky texture as well.

Addition of tallow fat to the dough

Tallow is hard animal fat that is rendered from either beef or mutton. It is fundamentally made up of triglycerides. It also consists of carbohydrates, fats, and protein. As the LDL cholesterol which is considered to be the bad cholesterol is found to be higher in the tallow fat, therefore, it is considered to bring certain heart related issues. Saturated fatty acids such as palmitic acid, stearic acid, myristic acid, and unsaturated fatty acids like oleic and palmitoleic acids along with polyunsaturated acids as to linoleic and linolenic acids are also present. Tallow fat is used as a shortening agent for bakery products. In the 1990's McDonald's cooked French fries in tallow fat and cottonseed oil now they have switched to pure vegetable oil.

Similar to the lard fat the tallow fat was also introduced to the cake mix and it was found that the tallow fat contains a higher level of monosaturated di-saturated (GS2U) triglycerides and was solid at room temperature. The triglycerides are arranged asymmetrically and hence tallow crystallizes in the beta prime form. This structure in the tallow provides a good matrix due to which air bubbles are trapped and retained.

The tallow also provided the cake mix with an excellent fat substrate. They also improve the roll in properties, flakiness, and expansion as desired when added to the puff pastry as well. Tallow fat while used for deep frying gives a specific flavour to the fries and it was the reason for the marketing success.

OILS

Edible oils which provide essential fatty acids, nutrients, and energy have become an important part of our daily diet. The various types of oils vary in the composition of fatty acids and this directly affects the nutritive value of oils, and the comparative advantages and disadvantages of various types of oils. The cake batters containing liquid vegetable oils were found to have increased fluidity. Fats and oils tend to weaken doughs, lowering the extruded product's hardness and increasing its flexibility.

Addition of Sunflower oil to the dough

Sunflower oil, one of the most popular oils in the world is derived from sunflower seeds which contain about 45%-50% oil. It contains a high proportion of oleic acid and linoleic acid and a low amount of palmitic acid and stearic acid. It is highly beneficial in lowering cholesterol levels because of the high amount of polyunsaturated fatty acids. Sunflower oil is also considered a major source of vitamin E. In addition to this, the sunflower oil can be used for frying, baking, etc. as it has a high concentration of linoleic acid, one of the nutritionally essential fatty acids along with bland flavour and clear consistency.

The higher specific gravity and lower viscosity of the cake batter made up of wheat flour and sunflower oil had resulted in a reduced volume. The use of sunflower oil in batter also showed a decrease in the level of the moisture content which indicated less water binding capacity of cake with oil. The cake received 46 out of 60 for having a slightly dark brown crust, yellowish colour crumb, thick cell walls, compact grain, and firm texture.

Dough prepared using wheat flour and sunflower oil was soft, had the highest springiness and density. The diameter of the cookies was highest for the one made using sunflower oil along with larger spreads and lower heights. The consistency of the dough made of refined wheat flour and sunflower oil had increased with the continuous mixing in the farinograph. The reason for this may be the lack of smearing the flour particles which resulted in the gluten protein development during the mixing. The viscous and cohesive property of the oil resulted in a softer dough and the final product, the cookie had a higher spread value whereas the texture of the cookie was hard.

A study showed that the dough made of white flour using sunflower oil was not an oily paste and had a good consistency. Even though the final bakery product made of this dough had an oily core along with a slightly broken surface due to a weak gluten network, it had a good crust with a strong aroma and nutty flavour. However, the baking progress is weak in the dough made up of using sunflower oil and white flour.

Addition of Coconut oil to the dough

Coconut oil, obtained from dried coconut has been consumed widely in tropical areas. Along with the characteristic sweet smell, it also has an increased shelf life and melting point around 24°C which makes it suitable for use in the baking industry. Coconut oil is rich in medium chain fatty acids but lacks in polyunsaturated fatty acids and monounsaturated fatty acids (MUFA). Natural coconut oil when included in the diet has a positive effect against liver damage caused by the liver, improves the anti-inflammatory response of the immune system along with body lipid normalization. The high content of acids with short chain length in coconut oil helps in increasing metabolism rate and good cholesterol level i.e. HDL. In addition to this, it helps in reducing weight, has a positive effect on the gastrointestinal tract, and also helps in protecting the epidermis.

The use of coconut oil in the dough formation made of wheat showed an increase in specific gravity and a decrease in viscosity. The lower solid content which is present in coconut oil provides insufficient strength to the batter to withstand the raising action during baking results in the decreased volume. The moisture content of the cake decreased and showed more hardness along with chewiness which resulted in a score of 42 out of 60.

The coconut oil when added to the white flour during the mixing process, it was well incorporated and the dough was smooth and had elastic consistency with less stickiness and a pleasant smell. The final product had a fine crust and good rise in volume and thereby giving the bread a favourable appearance.

Addition of Palm oil to the dough

Palm oil, obtained from the fruit of the Elaeisguineensis tree is cholesterol free. It consists of a balanced level of saturated and unsaturated fats. These fats are found in different forms namely glyceryllaurate, myristate, palmitate, stearate, oleate, linoleate, and linolenate. It has a high amount of monounsaturated fatty acid and vitamin E but less amount of polyunsaturated fatty acid which makes it has excellent oxidative stability. Therefore, when it is used in food products, the final product tends to have a longer shelf and is less prone to rancidity. Palm oil is not only free of trans-fatty acids and cholesterol but also has high nutritional value and antioxidant properties.

The dough made of wheat flour, palm oil, water, lecithin, and sugar had a stiff texture which turned to be uniform and plastic after constant mixing. The dough rolled using palm oil was found to stick to the roller. Since palm oil had the highest solid content, the dough had low density which indicated the existence of pores in the product structure. This confirms that the highest solid content promotes the retention of gases in the dough structure.

The preparation of high antioxidants cake was done by adding red palm oil (RPO) into the initial dough. RPO is obtained through pre-processing followed by deacidification, and deodorization processes. RPO was used in three formulas namely F0 (0%), F1 (80%), F2 (90%) and F3 (100%). The highest preference value for colour was found in cake F2 whereas the lowest value was F0. The results showed that the difference in the amount of red palm oil addition had a significant effect on the colour quality of the high antioxidant cake. The product colour was found to be yellow brownish and golden yellow due to the addition of RPO which increased panellist preferences for the selected product. The highest preferred value for aroma and taste was found to be high in cake F2 and the least value was found in the cake F1 which indicated that the lower value of higher antioxidant cake showed that aroma quality of aroma was very strong and the higher value showed that aroma quality was very weak whereas, in the case of taste, the lower of taste score meant less quality of sweetness, while the higher of score meant that the taste quality is sweeter. In the case of colour degree, the higher the L value, the brighter the product colour The value for the colour degree of the high antioxidant cake was found to be 65.60 which was thought to be caused by carotenoid content pigments that dissolve in RPO, thereby giving the cake a reddish yellow colour. The value of hardness in the cake was found to be 650.67 gf whereas the bulk density value was 0.27 g/ml the overall results confirmed that cake F3 was best based on the highest organoleptic tests and also contained the highest red palm oil addition level and therefore has the potential to be a functional food alternative and have a positive effect in the prevention of atherosclerosis.

Addition of olive oil to the dough

The traditional tree crop of the Mediterranean Basin, Oleaeuropaebears olive fruits from which the olive oil is obtained. Olive oil consists of triacylglycerols, mono, and diacylglycerols, free fatty acids, lipids along with phenolic and volatile compounds. The fatty acids include palmitic acids, palmitoleic acids, stearic acids, oleic acids, linoleic acids, and linolenic acids. Olive oil consumption decreases the occurrence of degenerative diseases such as coronary heart disease and cancer. Olive oil contains polyphenols that have antioxidant properties. In addition to this, olive is known for decreasing oxidative stress.

The Madeira cake batter prepared using olive oil showed increased batter density because of the less ability to entrap air

by the olive oil. The final product was found to have a high volume. This could be due to both the amount of air incorporated in the batter at the start and the amount of air retained during the baking process.

In a comparative study conducted, the L value (average abscissa at rupture) was highest for the dough made using olive oil. The final product, parotta was soft with slight chewiness along with a clean mouthfeel and hence obtained a high sensory score for hand feel and texture. Parottas were rich in oleic acid. The scoring was 89.5 out of 100 for the overall grade of parotta made using olive oil. The study concluded that the results found were related to the fatty acid profile and total fatty acids of the oil used.

The addition of olive oil to a dough made with wheat flour and freeze dried mango resulted in the dough being less firm, which could be due to the oil altering the creation of a complex between the gluten network and starch, resulting in the dough's decreased tenacity.

Addition of groundnut oil to the dough

Groundnut oil, also known as peanut oil is derived from the seed of Arachishypogaea Linn. It is a vegetable oil that contains only a small amount of non-glyceride constituents. It consists of oleic acid, linolic acid, palmitic acid, stearic acid, arachidic acid, and lignoceric. Monounsaturated fat (MUFA) when consumed shows a decrease in LDL cholesterol and raised HDL 2-4 cholesterol levels. Peanut oil is found to have a positive effect against CVD risk, may enhance serum lipid profiles, and decrease LDL oxidation, along with improving cardioprotective effect.

The dough made of wheat flour and groundnut oil showed a reverse trend in extensograph and mixograph characteristics resulting in a drop in the strength of the dough. The incorporation of 20% groundnut oil showed a reduction in compressive strength of wheat flour from 0.350 to 0.282 cm^2. When the dough's oil content was increased from 0% to 20%, the force decay parameter values climbed from 0.791 to 0.828, indicating that the dough's strength had decreased.

The addition of sugar and oil to the dough separately resulted in a soft dough. In addition to this, the decline in hardness values was found to be higher in the dough containing oil. The cohesiveness of the dough was observed to decrease as the amount of oil in the dough increased, indicating that the dough offered less resistance to the compression force. Additionally, when oil was added to the dough, the adhesiveness values decreased, resulting in less dough stickiness.

Addition of corn oil to the dough

Corn oil, also called maize oil is obtained from maize germ the embryos of Zea mays L. Corn oil is consists of triacylglycerols, free fatty acids, mono and diacylglycerols, along with several lipid compounds namely hydrocarbons, sterols, aliphatic alcohols, tocopherols, and pigments. The fatty acid composition consists of a high amount of oleic acid followed by linolic acid whereas palmitic acid, stearic acid, arachidic acid, and lignoceric acid are found to be in fewer amounts. They work as therapeutic drugs by attaching to the membranes of cancer cells or their receptors, producing cytotoxicity, apoptosis, and tumour growth suppression. The oil is easily absorbed by human bodies, with an absorption rate of up to 97 per cent. As a result, it is regarded as excellent culinary and medicinal oil.

DISCUSSION

The cake prepared using 100% maize germ oil (MGO) was found to show increased volume. The oil showed resistance during mixing resulting in the hard texture. In addition to this, the product was had an increased spread ratio and the crumb colour being yellowish. The cakes with 60% MGO were found to have maximum scores for overall quality and taste [1-9].

CONCLUSION

Since many bakery products are available in the market, the flour and fat/oil used in the product varies. The properties of dough used in bakery products differ depending on its composition which includes the type of flour, water, emulsifiers along fats and oils used. Fats and oils have various positive functional characteristics on the baked products. In addition to this, the organoleptic properties are also significantly influenced by fats and oils. The different types of fats and oils that are utilized play a vital role in the formation of dough giving it the desired property. According to the studies, it is proven that the properties of dough depending on the fats or oils that are used. If we consider health the vegetable derived fats or oils are the best that can be utilized for the making of dough compared to animal fats. Most of the animal fats are usually reduced or replaced by plant derived fats or oils. Studies confirm that the oils such as corn and olive were found to give a better property and structure to the dough and have good health benefits as well. But when we consider the texture, density, and such other properties, animal derived fats are also found to be considered necessary in the making of the dough. In fats, vegetable fats were found to be the best for the preparation of dough as they gave good results to the end product and had no such health issues. Depending on the desired end product, the type of fats or oils is decided to be added to obtain a better outcome.

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