

Applying a coating
based on essential
oils to improve the
quality and reduce
the ...



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The strawberry is very vulnerable to the growth of pathogenic microorganisms and the deterioration of the quality due to its high content and composition of water. Essential oils are effective in keeping products alive, increasing shelf life. The objective of this research work will be to improve the quality and reduce the natural microflora of strawberry fruits by applying a coating based on essential oils. To do this, the strawberry will be covered with emulsions containing clove essential oil, ginger essential oil and cinnamon essential oil. The samples will be packaged in a sterile aluminum foil and placed in a refrigerator at a temperature of 5 ° C for 21 days for further analysis. The physical-chemical analysis (weight loss, humidity percentage, pH, titrated acidity, total soluble solids, ascorbic acid and color) will be carried out in each interval throughout the period. An antioxidant analysis will be carried out to evaluate the antioxidant activity of coated and uncovered strawberries.

Sensory analysis will be conducted to check the quality of the coated and uncovered strawberries during the storage period. The data thus obtained will be statistically examined with a significance level of 5% for evaluation of treatment.

Pakistan was blessed with lush lands and a favorable atmosphere for the growth of a variety of fruits and vegetables throughout the year. It is expected that proper management and export of fresh horticultural products, especially fruits, can help in achieving the country's socioeconomic status. In addition, the geographical area of the county confirms the growth of a variety of fruits, including strawberries, apples, citrus fruits, mangoes, apricots, etc.

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But, to our surprise, due to lack of management after harvesting, inadequate processing capacities and rough processing, a large amount of this perishable product is lost. It was estimated that losses after harvest are about 25-40% of the total production, which leads to large cash losses.

A number of factors interfere with the reduction in the useful life and overall quality of fruits and vegetables, such as fermentation, water loss and microbial growth. These changes often lead to loss of moisture, loss of stored energy and various physiological disorders.

In addition, inadequate conservation methods are also the main factor that leads to deterioration in quality. In an effort to reduce these problems, the need for nutrients with long shelf life and high quality has led to the development of numerous innovative methods to maintain their natural appearance and at the same time make them safe.

Strawberry (*Fragaria ananasa*) is grown all over the world and is appreciated for its outstanding characteristics of juicy texture and strong flavor. This is beneficial to the owners of small land, because it is used all over the world because of its tasty and refreshing qualities, which also have great dietary value. The strawberry fruit is used as fresh, but it can also be kept to make jams, jellies and pumpkins for use in low season. The main varieties grown in Pakistan are Nur, Duglu, Chandler, Tuftus, Karosa, Pajaro, Comandante and Corona.

Strawberry is a nutritious point of view, laden with numerous phytochemicals that sanction health, vitamins and minerals that are vital for optimal health.

The consumption of strawberries, mainly consisting of anthocyanins and <https://assignbuster.com/applying-a-coating-based-on-essential-oils-to-improve-the-quality-and-reduce-the-natural-microflora-of-strawberry-fruits/>

ellagic acid, has proven very effective against various food and neurological diseases, such as cancer, scurvy and aging, etc. Strawberries are an excellent source of vitamin C (approximately 98% IDR) that helps the body develops a strong immune system and demonstrates greater resistance against inflammation and free radicals in the body with high antioxidant activity.

The fruit is very perishable, accompanied by a high sugar level and a lower pH, which provides optimal growth conditions for pathogenic bacteria. Very soft skin gives germs an easy entry, increasing the likelihood of infection in strawberries compared to other fruits. Presence of post-harvest pathogens in strawberries, such as *Botrytis cinerea* and *Penicillium* spp. this can affect the growth and survival of foodborne pathogens that cause various diseases in humans.

The toxicological effects of a synthetic antioxidant and consumer preference for a natural product led to the use of natural antioxidants. The antioxidant activity of plants was studied by extraction of tocopherols, vitamin C, carotenoids and phenolic compounds. In addition, the plant protection potential of a phenolic compound is of great importance to both the consumer and the producer.

In connection with the aforementioned consequences, the food industry has tended to reduce the use of chemical additives in its products due to the collective pressure of consumers and the ruling forces, or to completely eradicate the use of traditional disinfectants because of their harmful aspect

or to use a natural alternative for preserving and improving the service life product.

Possible sources of antimicrobial compounds are plants and their essential oils, they are a good alternative to chemical disinfectants, which are currently used in industry. Several studies have reported that plant essential oils have high antimicrobial activity against various types of foodborne pathogens.

Several conservation methods have been developed to extend the commercialization distance, thereby improving the maintenance periods for fresh horticultural products. Low-temperature storage, controlled atmosphere packaging, food additives and chemical disinfectants are among the various methods used to preserve the quality of fresh products. Coating with edible material is one of the highest favorable conservation methods used to preserve fresh fruits and vegetables with the benefit of attracting consumer attention.

Coating Films and emulsions act as an impediment to moisture and oxygen during processing and storage, thus improving product life. It has been found that the hydrophilic quality of the edible coating is a limitation of its use, since it does not provide the required coating function. The recent approach used to reduce this obstacle is the addition of biologically active compounds to the coating composition to improve its quality characteristics.

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Similarly, with the development and improvement of technology, the concept of ecological and edible coatings appears, which not only will process moisture loss and improve shelf life, but will not be associated with physiological losses. The blend of essential oils in edible coatings improves antimicrobial and antioxidant properties, and also slows the transfer of water vapor and the respiration rate of the product, which ultimately contributes to the extension of shelf life with preservation of quality and sensory attributes.

Edible plants have a large number of natural antioxidants, especially spices and herbs. Many researchers have confirmed the antioxidant potential of plants, especially spices. Ginger, commonly used in food products, as spices give it a better taste, is now under a lot of interest in research. This is an important spice used as a seasoning in various foods, both traditional and non-traditional. Numerous studies of this time have shown good antioxidant activity of *Zingiber officinale*.

The volatile essential oils that give the characteristic taste of ginger range from 1-3%, and the oleoresins that are responsible for its spicy flavor range from 4-7.5%, and also have broad antioxidant activity, The chemical composition of ginger contains protein 8.08 g, fat 5.72 g, ash - 2.85 g; minerals, namely iron 8 mg, calcium 88.4 mg, phosphorus 174 g, zinc 0.92 mg, copper 0.545 mg, chromium 70 mg, manganese 9.13 mg and vitamins 9.33 mg per 100 grams. Dry powder of ginger rhizome (ginger powder),

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commonly used to add flavor to foods and other recipes. It is widely used around the world in food as a condiment. Bioactive ginger residues with antioxidant potential are gingerol, gingerol, stepper and zingerberino.

Carnation (*Syzygium Aromaticum* L.) is used to preserve food without cooling. It belongs to the family Myrtaceae. Whole or ground cloves and ginger contain 15-20% volatile oil by weight. The composition of clove oil contains 70-95% of eugenol, more than 17% of eugenol acetate, and 12-15% of beta -caryophyllene. Eugenol is a natural antibiotic. The nail is effective against pathogens such as *Bacillus subtilis*, *Clostridium botulism*, *E. coli*, *L. monocytogenes*, *Salmonella typhimurium*, *Staphylococcus aureus*.