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REDUCING THE USE OF ANTIBIOTICS BY USING NATURAL MEDICINAL PLANTS IN MEAT FARM ANIMALS: A REVIEW

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Abstract
The use of some chemical preservatives that have been proven to have side health effects has spread, in addition to the occurrence of some dangerous diseases such as poisoning or cancer. It was found that the use of nitrite compounds that produce nitrosamines is one of the causes of many diseases, especially cancer, as well as the ability of some microorganisms to Resistance to these substances by producing substances that inhibit or impede the action of chemical compounds used in food preservation and to reduce and eliminate the effectiveness of microorganisms as a method of food preservation Medicinal plants have been used in many areas of life... Many studies have been found that confirm that these plants are not used for collateral damage and their security field makes them used more widely in the fields of life, especially in the medical fields and in the treatment of many diseases, especially incurable diseases. Studies have increased in recent years towards the use of natural additives, including herbs and medicinal plants as food additives and antimicrobials, as they are of natural plant origin and are safe to use instead of chemical industrial additives, whose use in meat and its products has caused the concern of most consumers because of its negative effects on human health as it is the main cause of diseases carcinogenesis .Therefore, attention was directed towards studying the properties of these natural additives and their anti-microbial properties .

Keyword: antibiotics, meat, plants, animals.

Introduction

The correlation of the nutritional value of meat with its high content of proteins, fats, some vitamins and mineral elements meat and its products are sensitive and susceptible to spoilage and contamination through physical and chemical changes that it undergoes after slaughtering the animal. The process of corruption that occurs in meat and its products is one of the problems. The task facing meat processors during the storage period (Gray et al., 1996; Choe et al., 2011). Meat is a suitable medium for the growth of many microorganisms that cause corruption and spoilage, which leads to great economic losses, and may also affect the public health of the consumer, especially in developing and poor countries. (W.H.O, 2002). The production of factors

that cause corruption and contamination and a rapid development in undesirable flavors of meat during the storage period results in food and economic losses, reducing the shelf life of the product and the production of toxic and undesirable compounds (Esterbauer, 1993; Choe et al., 2011). These natural food additives are effective As an antibacterial material that can be added to meat and meat products (Hossain et al., 2008; Hossain et al., 2010). Studies have proven that many medicinal plants contain many effective phenolic oil compounds, the most important of which are carvacrol (Baranauskiene et al., 2005) and thymol, terpinene and cama terpenes (Pino et al., 1997). These phenolic compounds have the advantage of possessing antioxidant properties through their strong potency and low toxicity compared to those of synthetic antioxidant phenols.

A historical overview of the use of medicinal herbs and plants

There is a wide use of medicinal herbs in various fields, including medicine, veterinary medicine, nutrition, flavoring materials, drinks, insect repellents, perfumes, cosmetics, smoking and other industrial uses. In prehistoric times herbs were the basis for nearly all medical treatments until the development of the drug industry in the nineteenth century. Today, herbs are still used 40% of the time in prescription medicines (Smith and Winder; 1996). It was not limited to drugs , but it was found that some of them are used as food additives, as they are used as food preservatives or with the aim of eliminating or limiting microorganisms (Swann, 1975 Kinlble; 1977). Moreover, various herbs along with vegetables and fruits contain many Of chemical compounds as well as phenolic compounds such as nitrogen compounds and carotenoids as well as ascorbic acid, and many of these compounds possess a very important antioxidant capacity accompanied by reducing negative effects and lowering the rate of cancer deaths in many human societies (Velioglu et al., 1998).

The importance of medicinal plants

Plants are used for a variety of purposes, including food, medicinal, flavorings, and in the manufacture of beverages, colorings, food preservatives, insect repellents, cosmetics, and other industrial uses (Smith and Winder, 1996)).

It has been known that many edible plants and food seasonings are potential sources that can be used successfully as anti-microbial agents, in addition to being safe for health (Isao et al., 1993)).

Chomchalow (2000) defined medicinal plants as plants that have active ingredients that are mainly used to prevent or treat physical ailments and may have other qualities that allow them to be used as insecticides that infect plants, food preservatives, natural dyes and for other purposes (Al-perkhdri et al., 2020).

Several edible plants are considered as potential sources of safety for health and can be used as antimicrobial agents (Isoa et al., 1993). As these plants are used for various purposes, including food and medicine, and insect repellents in other uses (Smith and Winder, 1996), by-products of the queen of plants can be used in the treatment of many intractable diseases of humans and animals, as well as They are used to kill and

inhibit microorganisms that infect humans through ingestion of food, and the use of these plants is considered safe and does not cause any harmful side effects (Al-perkhdri , 2021) .

Use of medicinal plants and spices as antibacterials and preservatives

It was found that some medicinal plants, especially Nigella sativa powder and its oil extract, have an inhibitory activity against Listeria after one day of incubation at a temperature of 37 °C (Mahmoud, 1993) McCarthy et al., (2001) indicated that some medicinal plants, especially thyme and cloves, have inhibitory activity against B. subtilis and Staph. Aureus . Smith-Palmer and others (1998), they found that the volatile oils of 21 plants are effective in preserving food from bacteria L. Monocytogesis, E.Colli, Staph. Aureous , Compylo bacter jejuni. Lin et al., (1998) found that garlic has a high inhibitory activity for different types of microorganisms, including (staph. aureus, microbacterium smeqmakis, c. calbicans yeast, A. niger mould). The cold and hot aqueous and alcoholic extracts of the hero brush plant were found to have an inhibitory activity against ps.aeruginous bacteria. (AL-Helli, 2000). The results of Al-Kanhal et.al., (2002) also showed that the volatile oils of the fennel plant have a high inhibitory activity against many bacterial genera, including streptococous and pesudomonas. In another study, it was noted that the use of pepper and garlic fruit extracts was effective in inhibiting the growth of many microorganisms that cause food and meat spoilage and spoilage (Ejechi and Akpomedaye, 2005). The study conducted by Singh et al. (2006) also showed that the oil extract of the star anise plant has a high activity against: Staphylococcus.aureous and Bacillus subtitles. Banon et al. (2007) found that adding aqueous extract of green tea at a concentration of 300 mg/kg of minced beef stored at 4 °C for a period of 9 days led to a decrease in the total number of bacteria on the sixth and seventh day of cold storage, and that the total number increased With an increase in the storage period, especially in the comparison treatment, and it reaches the largest number of colony-forming units/gm of meat, and in this case it is not acceptable.

Use of Medicinal Plants and Spices as Antibacterials

Chemical preservatives have been used to eliminate or reduce the effectiveness of microorganisms as a means of preserving food and often have side health effects as well as the occurrence of dangerous diseases such as poisoning or cancer.(Rekawt et.al.,(2021). The study of Smith-Palmer et al. (1998) indicated that the use of volatile oils for 21 plants is effective in preserving food from bacteria, Ecoli, Staph.aureus, Sal.anteridis, Campylo bacter jejuni and L.monocytogenes, where its minimum inhibitory concentration reached inhibitory concentration (MCL) between 0.01-0.5% at 35°C. Ates and Erodogrul (2003) concluded that Chinese bark extracts have inhibitory activity against 13 bacterial isolates including Entrococcus faecalis, B.cereus Eu, Micrococcus loterus and Listeria monocytogenes, with inhibitory diameter ranging from 7-9 mm/20 µg. In a study conducted by Ahn et al. (2002) using natural

inhibitors against E.coli and Listeria monocytogenes in ground beef, they showed that adding grape seed extract and rosemary extract at 0.5% to ground beef led to a clear inhibition of the growth of these bacteria. The use of plant extracts, especially pepper and garlic extracts, was effective in inhibiting the growth of a group of microorganisms that cause food and meat spoilage (Ejechi and Akpomedaye, 2005). Singh et al.(2006) showed that the oil extract of the star anise plant showed high activity against Staphylococcus aureus and Bacillus cereus, while the acetone extract had an inhibitory activity against Salmonella aeruginosa and Bacillus subtillis. Yano et al. (2006) also indicated that the lowest inhibitory concentration was 0.125% against Vibrio parahaemolyicu bacteria when using cloves and marjoram when grown on Nutrant Agar and incubated at 30°C. Banon et al. (2007) showed that adding the extract of aromatic plants, including the aqueous extract of green tea, at a concentration of 300 mg/kg of minced beef and stored in refrigerated (4 °C) for a period of 9 days, led to a decrease in the rate of total bacterial number on the sixth and seventh days of cold storage and that the average The total bacterial number increases with the increase in the storage period, and in this case, the meat is not acceptable. Georgantelis et al. (2007a) that extracts of rosemary had a clear inhibitory activity against Enterobacteriaceae and Pesudomonas.spp, and this activity increased when the extract was combined with the addition of chitosan to fresh sauce stored at 4°C. Busatta et al. (2008), when studying the lowest inhibitory concentration of essential oils for some medicinal plants, especially marjoram, indicated that there are 10 bacterial species present in meat and meat products, namely Aeromonas sp. , Bacillus subtilis, Enterococcus faecalis, Escherichia coli, Klebsiella pneumonia, Salmonella choleraensius, Serratia sp. , Shigella flexneri, Staphylococcus aureus and Streptococcus mutans, where the results showed that all microorganisms showed high sensitivity to oils with the lowest inhibitory concentration values ranging from 0.069 - 2.3 mg / ml. Also, Al-Rubeii et al. (2009) showed when they studied the effect of adding rosemary, sage, cloves, marjoram and mustard to minced beef stored at a temperature of 4 °C, and there was a clear inhibition in the total bacterial number and cold-loving bacteria compared to the control treatment. The study of the antibacterial activity of some plant extracts found that the methanolic extracts of Vicum album and Alkanna tinctoria showed inhibitory activity against nine studied microorganisms out of 32 species, while the methanolic extracts of Inula-attcherana showed inhibitory activity against a number of microorganisms, including Bacillus cereus, Staphelococcus aureus, Pesudomonas aeruginosa, and Cladosporium herbarum (Sengul et al., 2009). The addition of ratios 1, 2, 3, 4, 5% of the essential oils of marjoram and thyme or a mixture of the two plants to minced beef and stock at a temperature of 4 °C led to a clear inhibitory activity against all types of bacteria studied, including E.coli and Staph. aurteue, Pesudomonas aeruginosa, and L.plantarum (Emiroglu et al., 2010). Yu et al. (2010) concluded that phenolic extracts of field pistachio husks added to raw and cooked ground beef led to a total inhibition

of the growth of laboratory bacteria Staphelococcus aureus, Salmonella typhimurim, Streptococcus faccalis, Bacillus subillis and E.coli. The antibacterial activity of the essential oils of marjoram when added at a rate of 0.6% or 0.9% alone or combined with 500 or 1000 IU/gm of niacin to minced lamb and stored at a temperature of 4 or 10 °C for 12 days, where the results indicated that adding 0.6 6% of essential oils supplemented with 500 IU of niacin had the strongest inhibitory activity against Salmonella enteritias compared with adding 0.6% of essential oils alone (Govaris et al., 2010). The addition of natural antimicrobials such as rosemary extract, grapefruit seed extract or thymol and other natural additives to beef stored under pressure led to inhibition of the growth of many types of bacteria, including Lactobacillus algidus, Leuconostoc mesenteroids, Leuconsotoc carnosum and Carnobacterum maltaromatia (Schimer et al., 2010). Sagdic et al. (2010) showed that the addition of Nigella sativa had the highest inhibitory activity against C.zeylanoides and C.lambica yeasts. As for the results of adding the essential oils of marjoram, garlic and sweet pepper, it showed an inhibitory activity against three types of bacteria Listeria monocytogenes, Salmonella enteric and E.coli O157:H7, and this effect was greater in marjoram than in garlic and pepper (Du et al., 2010).

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