



PROSPECTIVE UTILIZATION OF ESSENTIAL OILS AS A VALUABLE VETERINARY MEDICINE: A REVIEW

Raviraja Shetty G.

Zonal Agricultural & Horticultural Research Station, Brahmavara
University of Agricultural & Horticultural Sciences, Shivamogga, India

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ABSTRACT

Essential oils (EOs) are secondary metabolites of plants employed in folk medicine for a long time. Unique aromatic compounds give each essential oil its characteristic essence. Essential oils usually contain two or three major terpene or terpenoid components, which constitute up to 30% of the oil. Made up of aromatic and flavor compounds extracted from various plants, essential oils have exploded in popularity. They are commonly used in aromatherapy and generally considered “natural” treatment options and an alternative to traditional western medicine. In veterinary medicine, aromatherapy offers many benefits for a wide variety of problems, both physical and behavioral/emotional. Advantages include a convenient alternative to oral medications with excellent compliance. However, incorporating essential oils into veterinary practice can prove challenging; available products vary tremendously in quality and cost. Consequently, education is vital when utilizing essential oil safely with animals.

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INTRODUCTION

Essential oils are chemical compounds which are odoriferous and highly volatile in nature and they insoluble in water soluble in organic solvents. These are the aromatic oily liquids present in aromatic crops and extracted from different parts like leaves, bark, stem, roots, flowers, seeds, etc. Essential oils have been used for ages in religious ceremonies for offering Gods, as perfume, in food flavoring, as preservative substances and used ancient medicines. Clerk and Shivik (2002) studied on aerosolized essential oils and individual natural product compounds as brown tree snake repellents and they reported that brown tree snakes were naturally repelled by using cinnamaldehyde oil aerosol (1ml/100ml of water). Clarence *et al.* (2012) studied on effect of lavender oil in aromatherapy on acute-stressed horses and they reported that lavender oil in aromatherapy will reduce nervousness among horses.

In modern days these essential oils are roots for pharmaceutical industries, main ingredients in food industry as a flavor, main sources for agarbathi industries, core materials in cosmetic industries, used in preparation of aromatic candles and they act as plant protecting agents un organic farming. Apart from these industries essential oils commercially used in veterinary industry. In veterinary industry these oils used as medicine, as nutrition as feed additives and to maintain the hygienity in animals. Essential oils mainly used in aromatherapy; the word aromatherapy was found by Rene mourice guttefoss during 1st world war. He accidently invented healing property of lavender oil and before using these oils on human beings, he tested on dogs and horses. This is first reference were the essential oils used in animals. Alexandre peron (2013) studied on the effect of essential oil compounds on performance and gut health of piglets and they reported that essential oil

compounds has a positive effect on the overall gut health of piglets raised without the use of antibiotics Cabuk *et al.* (2014) studied on effects of herbal essential oil mixture as a dietary supplement on egg production in quail and they reported that the mixture of essential oil (carvacrol, thymol, 1,8 – cineol, p-cymene and Limonene at 24mg/kg feed) as an alternate to commercial antibiotic (Availmycine 10 mg/kg feed) as feed supplement for increase egg production in quail. Yazdi *et al.* (2014) studied on effects of specific essential oil compounds on feed intake, milk production and ruminal environment in dairy cows during heat exposure and they reported that essential oil compounds (2g/cow/day) in diet fed to lactating dairy cows experiencing heat stress increased the dry matter intake and milk yield. Mathlouthi *et al.* (2015) studied on use of rosemary, oregano, and a commercial blend of essential oils in broiler chickens and they reported that supplementation of oregano essential oil in boiler can control the infestation and they enhance the growth performance and immunity in boiler chickens.

Industrial application of essential oils: -

- In veterinary industry
- Food and beverage industry
- Cosmetic industry
- Pharmaceutical industry
- Paper and printing industry
- Petroleum industry
- Paint industry
- Insecticide industry
- Textile industry
- Tobacco industry etc.

Application of essential oils in veterinary industry :-

- As nutrition
- As medicine
- Used as feed additives
- To avoid parasites
- For preservation of meat and milk
- In dairy industry
 - In aromatherapy of animal
 - In wild life science and
 - In preparation of animal cosmetics.

Essential oils as medicine in animals

Essential oils are grouped into different categories according to veterinary material media :-

- **Carminative group:** Cardamom, Ginger, Asafoitida
- **Expectorant:** Anise, Camphor, Basil.
- **Diuretics and urinary antiseptics:** Cubeb, Copaiba, Sandalwood oil.
- **Vermicides and parasiticides:** Ajowan, Chenopodium, Thymol

- **Counter irritants:** Eucalyptus, Turpentine, Cajuput, etc.

Essential oils as nutrition:-

Antibiotics are majorly used in animal nutrition as growth promoters but these antibiotic growth promoters, are completely banned as feed additives in the European union since 2006 because they are suspected to increasing resistance among human pathogens. Hence to replace those antibiotics essential oils are commercial using now.

Development of antibiotic resistance:

Irrational use of antibiotics in feed additives of animals in poultry, in dairy cows and in pigs will kill most of the bacteria's present in microbial gut but the resistance bacteria will survive and multiply in guts of these animals. The survived bacteria will become resistance for all the antibiotics known as super bug. These resistance bacteria will spread through the animal produce by contaminated water and soil, by contaminated surface, through the animals fecal matter or by manure and through the contaminated food and environment. Spread of resistance bacteria shows a major impact on human health like:

- Increased human morbidity.
- Increased human mortality.
- Reduces efficacy of related antibiotics used in humans.
- Increased human health care costs.
- Increased potential for carriage and dissemination.
- Facilitated emergence of resistance in human pathogens.

Phytogenics: Herbs and plant used in animal food called phytogenics.

- It improves the gut micro flora
- Increase the digestibility
 - Modify the digestive secretion morphology
 - Reduce the microbial toxins
 - Increase overall performance of animal

Essential oil in dairy cows :-

In dairy industry essential oils are commercially used because of their benefits viz, for

- Stimulate of rumen fermentations.
- Inhibition of methanogenesis.
- EO modify the ruminal volatile fatty acids and nitrogen metabolism.
- EO interact with microbial cell membranes.
- To increase amount and quality of amino acids available for milk production.

Table 1 : Essential oils with antimicrobial activity in dairy cows.

Essential oil	Name	Active components	Susceptible microorganisms
Allium sativum	Garlic	Allicin, diallyl sulfite	Enteropathogenic bacteria
Anethum graveolens	Dill	Limonene, carvone	Gram-positive and negative bacteria
Capsicum annum	Paprika Paprika	Capsaicin	Gram-positive and negative bacteria
Cinnamomum cassia	Cassia	Cinnamaldehyde	Escherichia coli, Staphylococcus aureus, Listeria monocytogenes, Salmonella enteritidis
Juniperus oxycedrus	Juniper	Cadinene, pinene	Aeromonas sobria, Enterococcus faecalis, Staphylococcus aureus
Melaleuca alternifolia	Tea tree	Terpinen-4-ol	Staphylococcus aureus, Escherichia coli, Gram positive and negative bacteria
Origanum vulgare	Oregano	Carvacrol, thymol	Gram-positive and negative bacteria
Pimpinella anisum	Anise	Anethol	Aeromonas hydrophila, Brevibacterium linens, Brochothrics thermosphacta
Rosmarinus officinalis	Rosemary	1,8-Cineole	Staphylococcus aureus, Listeria monocytogenes, Campylobacter jejuni
Syzygium aromaticum	Clove	Eugenol	Escherichia coli, Staphylococcus aureus, Salmonella enteritidis, Campylobacter jejuni
Thymus vulgaris	Thyme	Thymol, carvacrol	Salmonella typhimurium, Staphylococcus aureus, Zingiber officinale
	Ginger	Zingiberene, zingerone	Gram-positive and negative bactetria

Aromatherapy in animals:

- Aromatherapy is effective in treating a number of animals health problems, such as skin irritations, ear infections, hyperactivity, flea/tick infestations, and much more.
- Aromatherapy for animals refers to the therapeutic use of 100% pure essential oils and hydrosols for holistic treatments of physical and behavioural problems in animals.
- Hydrosol is a water-based substance which is a by-product obtained during the steam distillation process of an essential oil. A hydrosol contains water-soluble parts of a plant as well as very small amount of some essential oil components.
- For extremely sensitive dogs, small dogs and for cats hydrosols are good alternative.

Some of the essential oil used for the aromatherapy for animals : Bergamot, carrot seed, cederwood, german chamomile, roman chamomile, clary sage, eucalyptus, geranium, ginger, helichrysum, sweet marjoram, lavender, pepper mint, sweet orange, junifer.

Aromatherapy for animals can be applied by following method they are:

1. Topical application: It is the most commonly used technique and has the greatest benefit because the oils are applied directly to the area needed. The oils penetrate the skin and are quickly adsorbed by tiny capillaries which carry them to the bloodstream.

Essential oil can be topically applied via massage, or via sprays and of course the oils can also be added to shampoos, conditioners, slaves, ointments, etc.

2. Petting

This method involves diluting the oils by rubbing them into the palm of your hand. This can be done either straight or with an organic diluting oil.

This is followed by swirling the oils in your hand. Varying amount of the oils depending upon the needs and size of the animal are applied petted onto the animal.

The oils will be adsorbed via the hair follicles.

This might include the base of the skull/ neck area for periodic calming, stomach for brief digestive support or paws.

3. Diffusion and inhalation

It is another way to practice Aromatherapy for dogs. A diffuser is used to evaporate the oils which are inhaled by dogs. Leave the diffuser on far about 30 to 40 minutes in order for dog to inhale and absorb the oil

4. Oral application

Oral application of essential oil to dogs should only be done under the supervision of a holistic veterinarian who has proper training in aromatherapy. As the oils are highly concentrated and potent, extreme care has to be taken to avoid overdose. And of course, some essential oils are simply not suitable for ingestion at all.

Aromatherapy in wild animals:

Piangnton zoo of England treating its Lion by aromatherapy since 2010. they reported that providing the aromatic hay pillow sprayed with peppermint has kept lion calm and relaxed.

CONCLUSION

Use of essential oil is gaining momentum as an alternative to antibiotics in animal nutrition for overall excellence of animals. They act as immunity enhancers and fight bacterial, fungal and viral infections hence, there is a vast scope for growing aromatic crops and using essential oils commercially in veterinary industry apart from perfumery, cosmetic and pharmaceutical industry. Though this essential oil has positive effects. But the knowledge of their use in animal nutrition is still limited and requires further research to clarify its mode of action as well as the exact supplementation level.

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