Herbs and Herbals in Animal Nutrition

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ABSTRACT

Herbs and herbal extracts have been used for thousands of years in curing and treating diseases in both human and animals. Records have shown that animals were fed herbs and spices to cure certain diseases more than 5000 years ago. The Indian ayurvedic and Chinese medicine used herbs and spices to enhance health and also treat diseases. Common spices such as tumeric, ginger and garlic have been indicated to contain active compounds that apart from giving flavour to our otherwise mundane cooked food, also contain compounds with properties that can improve health and increase immunity. Despite the widespread use of herbs as medicine, healing aids and health foods little work has been done to support the claims scientifically. Only in recent years that scientists have isolated and identified the active compounds in herbs in relation to their functions. It is known that many herbs contain one or more active ingredients and that combination of herbs tend to be more effective than the use of single herbs. However, the combinations have not been established and a lot more research is needed so that we can understand the functions of herbs. Herbs can be classified according to their functions or actions such as those that have antioxidants properties, antibiotic properties, immune system enhancer etc. Caution should be taken in using herbal preparations as many of these herbs have not been tested out fully and their safety as far as human health are concerned are still much to be understood. While it is natural for the public to assume that herbs are organic and safe, there have been incidences of toxicity, abuse and side effects produced by these herbs. Special care must be given when giving herbs as medication when the animal is suffering from kidney, heart or lung ailments.

Key words: herbals, antioxidants, natural cures, herbs in nutrition

INTRODUCTION

Under natural conditions animals instinctively look for and consume herbs to cure certain diseases. It has been observed that animals such as cats and dogs, rabbits and horses search for special herbs when they are sick. Traditional herbal medicine, whether Ayurvedic medicine, Indian herbs, Chinese herbs, Western herbs or African herbs are generally holistic in therapy and relies upon the whole plant, roots, seeds or leaves that has been established to be more effective. Traditionally the selected herb or parts of the herbs has not been presumed to contain a single pharmacologically-active ingredient.

Modern herbal medicine is going towards pharmacognosy, the science of defining 'active' ingredients, then extracting and purifying them and using them in isolation. This is not a holistic approach as individual active compounds may act differently and cause different effects. When herbs are used as a whole plant or leaves etc combined with other herbs these active ingredients work in synergy and in harmony hence give the desired effects naturally. However, this is not the case with regards to modern medicine as more and more herbs have been identified and the active ingredients isolated.

Classifications of Herbs

The Cherokee herb medicine advocated by (Winston D, 1992) divide herbs into three classes, namely, (a) the "food herbs" which are gentle in action, have very low toxicity, and are unlikely to cause an adverse response (e.g. Lemon Balm, Peppermint, Marshmallow, Ginger, Garlic, Chamomile, Hawthorn, Rose hips, Nettles, Dandelion Root and Leaf, and fresh Oat extract) and can be utilized in substantial quantities over long periods of time without any acute or chronic toxicity, (b) the "medicine herbs" which are stronger acting and used for specific purposes at proper dosage and may

have some adverse effects if wrongly used (examples are Andrographis, Blue Cohosh, Cascara Sagrada, Celandine, Ephedra, Goldenseal, Senna and Oregon Grape Root, and (c) "poison herbs", which are potentially toxic and need to approved by medical doctors under specific conditions (examples, Belladonna, Bryonia, Datura, Gelsemium, Henbane, Male Fern, Phytolacca, Podophyllum, and Veratrum).

Herbs contain a variety of pharma-cologically-active ingredients and each herb has its own unique combination and properties. In modern herbal medicine they are classified according to their action. Many herbs contain ingredients with actions such as anthelmintic, anti-catarrhal, anti-emetic, anti-inflammatory, antibacterial, antifungal, laxative, aromatic, diuretic, stimulant, etc. Herbal medicines can be classified according to the type of constituents in their composition, such as acids, alcohols, alkaloids, anthraquinones, bitters, cardiac glycosides, coumarins, flavones, flavonoid glycosides, phenols, saponins, tannins and volatile oils.

Why Use Herbs

The increase in research on the use of herbs in animal nutrition was spurred by the global effort in reducing the use of antibiotic growth promoters in poultry and livestock feeds. A lot of work has been directed towards replacing antibiotics with probiotics, prebiotics and also herbs while maintaining growth performance. Herbs are natural growth promotants and are safe for human consumption as they do not leave residues in animal products. The progressively reduction in the use of antibiotics will ensure that less and less antibiotic residues are in animal products. Herbs are also cheaper in the long run and may lead to lower feed costs. Ghalyanchi *et al*., (2008) compared the use of antibiotic, probiotics and two herbal preparation showed that the herbal preparations were effective in replacing virginiamycin as a growth promoter in broiler chicks. Earlier Demir *et al.* (2003) showed that replacing antibiotic with essential oils are effective in supporting growth performance of broiler chicks. These studies suggested that antibiotics can be replaced with herbs and essential oils of herbs without much affecting their growth performance.

Active Ingredients in Herbs

There is a logic in the notion that herbs indigenous to the patient's country should be used in preference to 'exotic' herbs, although Chinese and Ayurvedic herbs have become fashionable in the UK, at present. There follow some simplified examples of Western herbs, classified according to pharmacological activity: Herbal medicine includes such amazingly effective agents as willow bark (providing salicylate, which is an Aspirin-like and effective pain killer, at much lower doses than one might expect, when compared to Aspirin itself), Digitalis or foxglove (a remarkably effective heart drug, having action on all aspects of cardiac function), dandelion (an effective diuretic, providing copious potassium, which modern diuretics tend to drain from the body, - French name *pis en lit*) and periwinkle or Vinca (a predecessor of the potent cancer drug Vincristine).

Table 1. Some common and traditional cures using herbs*

	Herbs	Uses
1	Hops *Humulus lupulus*	Young shoots given to colts as a tonic to condition them. Flowers fed in fodder to quiet restless animals.
2	Conmmon Ivy *Glechoma hederacea*	Good for internal cleansing after birth, treating retained afterbirth.
3	Ladies mantle *Alchemilla vulgaris*	Cure for stones and a tonic after treating colic.
4	Common nettle *Urtica dioica*	Rich in minerals, calcium, sodium, iron, chlorine and a naturally good in protein value. Nettle juice is used to wash the coat, to give a beautiful shine for show.
5	Black poplar *Populus nigra*	Buds crushed in milk or honey make good tonic for horses. Make ointment for sores, wounds, ulcers.
6	Wild strawberry *Fragaria vesca*	For cleansing and antiseptic. A brew of the root and herb thickened with borax, removes old sores and dandruff.
7	Indian tea *Thea sinensis*	Good for sun stroke, sunburn, fine burns. To given as a drink.

* from various sources

Herbs and Healing of Wounds

Table 2. Shows some herbs and their function in wound healing

	Herbs	Uses and actions
1	Alfalfa	extremely rich in vitamins and minerals including iron, calcium, magnesium, phosphorus, sulfur, chlorine, sodium, potassium, silicon, and trace elements. It is a good source of carotene (Vit. A) and Vit. K, the blood clotting vitamin, prevent tooth decay.
2	*Aloe vera*	excellent for burns. It can be used by nursing mothers for sore nipples. Can be used as an eye drop to improve circulation and eyesight. It stimulates the circulation in wounded areas, which also promotes healing.
3	Calendula Flowers	Anti fungal inflammation fighter, soothing to the skin, healing properties, use as lip balm, or on cuts, burns, abrasions, and even sprains, anti fungal action is an aid for candida albicanas, athlete's foot.
4	Cayenne, capsicum	builds up the body's resistance, high in Vitamin C, general stimulants which is the key to healing, improves the entire circulatory system,
5	Comfrey	an infection fighter and blood cleanser, a contact healer (relieves pain and starts healing on contact). It is cell proliferate (helps grow new flesh and bone) and accelerates the healing process. The cell proliferate and active ingredient in comfrey is called allantoin. It helps with pain, repairs and heals, excellent for wounds, burns, cuts and abrasions and broken bones.
6	Echinacea	excellent infection fighter and is used as a natural antibiotic. It is especially good in glandular infections and problems. A good cleanser for glands and the lymphatic system.
7	Tea tree oil	has antiseptic and antibiotic qualities. It can be used as a topical antiseptic and unlike the other topical antiseptics (iodine, mercurochrome, etc.) it does not damage healthy tissue as well as kill bacteria so it does not interfere or slow the process of healing.

Herbs and Immune Response

A large number of studies have shown that *Echinacea* destroys many types of viruses and bacteria. It is popular in America, Europe and China as an immune enhancer. Siberian ginseng is another herb and its use is widespread in Soviet Union and it helps the body adapt and improve immunity under stressed conditions. Several medicinal herbs are used to enhance the immune system or bring it back up to normal levels folllowing an illness. Shitake mushrooms has been shown to exert positive effects on the immune system. An antiviral compound called lentinan in shitake mushroom stimulates the immune system. It appears that lentinan increases interferon activity. Peruvian rainforest herb cat's claw can be used to treat disorders related to the immune system, including rheumatoid arthritis, gastric ulcers, colitis and Crohn's disease, by increasing the amount of disease-fighting immune cells in their blood.

Herbs and Parasites

A number of herbs for cooking can be used to kill intestinal parasites such as ginger and essential oil can kill roundworms. Some studies have shown that ginger can be more effective than piperazine citrate.

Herbs and Meat Quality

The use of artificial antioxidants such as BHT, santoquin, and TBHQ to increase meat product shelf life is common practice. Although these have been claimed safe the long term effect on humans if taken continuously is not known. It is felt that natural antioxidants are more effective in retaining the quality of meat products and also their shelf life. Grape seed extract, a by-product of grape fermentation has been shown to be an effective antioxidant due to its phenolic contents. Jang *et al*. (2009) evaluated the antioxidative potential and quality of the breast meat of broiler chickens fed a dietary medicinal herb extract mix

(MHEM, consisting of mulberry leaf, Japanese honeysuckle, and goldthread at a ratio of 48.5:48.5:3.0). They showed that MHEM did not affect proximate composition of the breast meat. Phenols content of the breast meats in treated T2 diets was twice that of the control. The 2-TBA in the treated diets were lower than the control and did not increase during storage. They concluded that this herbal mixture increased the antioxidative potential and overall preference of breast meat during cold storage. A study was conducted to evaluate efficacy of herbal liver tonic and growth promoter (Superliv and Xlivpro) on the overall growth, performance and carcass quality of broilers (Sharma *et al*., 2004). There were significant improvements in growth performance in the in treated groups. The results also showed improvement in livability, carcass yield and carcass quality. It appears that polyherbal liver tonic formulations enhanced nutrient utilization. Meat from lambs raised on mountain pastures without any supplementary feeding or treatment is often considered to be of superior quality. This was because lambs on mountain pastutures had access to herbs and wild shrubs and the meat were often tasty. Adney *et al*. (2004) compared the carcass characteristics and meat quality of lambs grazed on lowland and mountain pastutures and showed that there were significant differences between the groups were found in grading, fat content and fatty acid composition, meat colour, and meat flavour. At UPM Karami (pers. comm.) compared goats fed supplements of Andrographis paniculata, tumeric and vitamin E to compare their antioxidant contents in meat. Meat of goats fed A. paniculata and tumeric had higher antioxidant activities and better sensory qualities.

Herbs and Reproduction

There are quite a number of researches on the use of herbs in reproduction. In early humans civilization the problem of infertility has been treated using herbs and other traditional ways. The effects of herbs on the reproductive activity in animals are not exactly defined. A number of articles written in the internet showed that herbs are commonly used in horses at various stages to improve reproduction (Wheeler and Wait, 1992). Recently, natural herbs have been investigated to look into their potential as reproduction enhancers. Work by Allan and Bilkei (2004) showed that Oregano (Origanum vulgare) enriched with essential of oregano reduced morality and increased farrowing rate in sows. Sows fed oregano had lower annual sow mortality rate , lower sow culling rate during lactation, increased farrowing rate, increased number of liveborn piglets per litter (10.49 ± 1.5 versus 9.95 ± 1.22, $P<0.05$), and decreased stillbirth rate. In the yak (Poephagus grunniens L.) using prepared Indian herbs (Prajana) Mohanty *et al* ---- showed improved estrus cycle by more than 40 %. On the other hand, Oyeyemi *et al*. (2008) examined the effect of extracts of Veronia antygdalina on the spermatozoa of Wistar rats. Rats supplemented with 500 and 250 mg of the extracts showed lower spermatozoa livability and mobility. They concluded that the uncontrolled use ol Vernonia amygdalina have an adverse effect on the spermiogram and spermatozoa/ morphology of the intact rats. In humans there are a number of herbs that can be used as improving the fertility of women. The table below shows some of the known herbs that are commonly used in herbal preparations to improve fertility.

Table 3. Examples of some herb that improve fertility in animals.*

	Herbs	Actions
1	*Centella asiatica* (gotu cola)	enhance male fertility, maintain healthy blood vessels including sperm-producing seminiferous tubules
2	Siberian ginseng	Effective aphrodisiac, promotes sexual functions, regulatory effect on mentrous cycle
3	Black cohosh	phytoestrogenic effect on the female body, naturally stimulating the ovulation process
4	Horny goat weed *Epimedium grandiflorum*	improves male potency and acts as an aphrodisiac. It also increases a man's sperm quantity and quality
5	Chasteberry:	hormonal balancer that helps the pituitary gland to function properly, regulates the ovulation process and maintains a healthy hormonal level within the body

* from various sources.

Herbs and Egg Quality

Studies conducted at UPM (Al kirshi, pers. comm) indicated that mulberry leaves when supplemented in layer diets shows that the yolk colour was enhanced and its antioxidant properties increased. This suggests that mulberry

leaves can be useful in egg quality and increase their shelf life. In his study the antioxidant content of egg yolk was also increased due to mulberry leaf supplementation.

CONCLUSIONS

Herbs and herbal extracts are potentially useful as growth promotants in diets and also as therapeutic agents to treat certain diseases and disorders. They can replace antibiotics, have immune enhancers and fight bacteria and viral infections. Although there are many herbs and herbal preparation in the market and their claims of healing and curing diseases it must be noted that there have been few scientific research and testing on the safety to animals and man. The dosage indicated by the manufacturers is generally based on common practice and traditional notes. Side effects are not normally stated and users are advised that they should follow strictly to the instructions given. Selecting what herbal preparation to use and when depends on various factors such as the species of animals, age and physiological status. Care must be taken not to abuse the use of these herbs by understanding their functions and what they can do.

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