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Shatavari: A potential herbal feed additive

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Introduction

Milk is considered as a wholesome food for people of all ages. The demand for milk is growing rapidly with the growing population. To meet the demand of milk, its production needs to be increased. Milk production involves complex physiological and psychological processes and hormonal interactions. Prolactin is a major hormone responsible for milk production. To increase the production of milk, feed additives like vitamins, minerals, hormones and drugs have been used in dairy animals. Overuse of feed additives such as antibiotic, probiotic, preservative, vitamin, amino acid and trace element can affect the productivity and reproductive performance of animals. Therefore, efforts are directed towards the use of herbal feed additives that are beneficial to milk production. Many herbs such as *Asparagus racemosus*, *Leptadenia reticulata*, *Celithania somnifera* and *Cissampelos pareira* have been used in dairy animals to improve milk yield. *Asparagus racemosus*, commonly known as Shatavari, is a medicinal plant which has been used in Ayurveda and is a generic medicine to cure different ailments in human as well as animals since ages. Apart from being a potent galactagogue, it has antitussive, antioxidant, antispasmodic, antibacterial, antidiarrhoeal and immunomodulatory effects. Research works have been carried out on its galactogenic effects in human and animals. Many commercially available galactagogues contain Shatavari. Systematic study is required to know the potent active principle of its roots to improve production performance in dairy animals.

The term galactogogue refers to the substances that increase the lactation performances; whereas, the term galactopoetic agents denotes hormone preparations which are used to enhance milk production in lactating animals. Herbal galactogogues are extracted from medicinal plants and their use along with effective management is a safer way of augmenting milk production in dairy animals, as herbal galactogogues possess comparatively safe galactogenic property. The herb and its combinations are advantageous for udder and reproductive health. Herbal feed additives improve serum immunoglobulin with a decrease in total leucocytic count, neutrophil and lymphocyte percent. They also affect the milk yield by modifying rumen ecology. Table 1 shows different varieties of herbs used for augmenting milk production.

Table 1. Different herbs having galactogenic properties and their active principles

Common name	Botanical name	Parts used	Chemical constituents
Shatavari	<i>Asparagus racemosus</i>	Root	Shatavarin I-IV, quercetin, rutin, hyperoside
Vidarikanda	<i>Ipomea digitata</i>	Tuberous root	Petrocarpanone, hydroxytuberosome, petrocarpene-anhydrotuberosin, 3-O, methyltuberosin
Jivanti	<i>Leptadenia reticulata</i>	Root	Leptadenol, triacotane, cetyl alcohol, leptidin-1- stosterol
Shaptapushpa	<i>Antheum sowa</i>	Flower head	Anethole, estragol, fenchone, B- sitosterol

The herb Shatavari

The meaning of the name Shatavari is ‘curer of hundred diseases’ and it is also known as Shatamull. Shatavari (*Asparagus racemosus*) belongs to the genus *Asparagus* and family *Liliaceae*. There are about 300 species under this genus. These herbs are rich in saponins and saponins. Different components of polyphenols and flavonoids with the active principles of shatavarin, sarasapogenin, racemosol and asparagamine are found in the roots of these plants.

Shatavaroside A and B together with a saponin, filiasparoside C⁻²⁷ are the two new steroidal saponins that have been found in the roots of Shatavari.

Uses of Shatavari

Asparagus racemosus has been used in Ayurveda for preventing and curing gastric ulcers, inflammations, liver diseases, infection and as a galactagogue. The methanol extract of the Shatavari root possesses some antibacterial property which acts against infectious diseases. It is traditionally used as a digestive tonic for diarrhoea, dysentery and indigestion. Inclusion of Shatavari in the herbal feed additive formulation at the rate of 25% has been found to increase dry matter intake by 10.97% in buffaloes (Mahantra *et al.*, 2003) while in cows feeding at the rate of 100 g on alternate day was successful (Berhane and Singh, 2002). Alcoholic extract of Shatavari root has also hepatoprotective and antimicrobial effects against pathogenic bacteria, virus, protozoa and fungi.

Feeding of Shatavari root as supplements leads to an increase in the weight of mammary and adrenal glands. It also increases the release of ACTH (Adrenocortico tropic hormone) as a result of well-developed lobular and alveolar tissues of mammary gland. Due to the mammogenic property on udder, *Asparagus racemosus* is an effective enhancer of milk production. Prolactin plays a major role in lactogenesis. Chemical components of Shatavari root like saponins, shatavaroside A and B along with filiasparoside-C act on pituitary and adrenal glands to release ACTH and prolactin. These hormones improve cell differentiation in mammary gland and thus increase the milk production.

The composition of milk changes with breed, age, parity and health status. Shatavari and its metabolites help in improving ruminal ecosystem. Supplementation of Shatavari can change the normal composition of milk. Somkuwar *et al.* (2005), Goel *et al.* (2007) and Tanwar *et al.* (2008) observed a non-significant increase in milk fat, protein, total solid and solid not fat in lactating cows and buffaloes on supplementation of Shatavari. An average of 220 to 387 mg/dl total cholesterol has been recorded in the milk fat. The value is higher for exotic breeds of cattle. Crossbred cows show higher cholesterol in milk fat on day one which decreases gradually

afterwards. Due to hypocholesterolemic effect, Shatavari decreases blood cholesterol level (Visavadiya and Narasimhacharya, 2005) thereby reduces the milk fat cholesterol.

Conclusion

Researches based on traditional knowledge can be an innovative way for discovering safer and affordable medicines. The lactogenic effect of Shatavari, if substantiated, would be a great contribution to farmers as well as consumers. Use of Shatavari in human also holds great scope in future.

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