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Review on Efficacy of Phytogenic Galacto Powder Supplement as Potential Galactogague

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Abstract

Milk production, in cattle as the name suggests is not just a monomer but a conglomeration of lactation issues faced by the industry like post-partum changes, endometritis, milk fever, acetonemia, oedema, galactic and may more. Synthetic substances named Galactogogues were used to combat this situation, but over a period of time and long applications lead to the reduction in the livability and disease tolerance of the animal, not to say a profound decrease in milk production. The herbal alternatives, the phytogenic Galacto herbs, involving the age old traditional Trigonella, Asparagus, Silybum etc when given as a synergestic blend acted as the Phytogenic Galactogoguesdue to their phytochemicals. The earlier studies on the individual Galacto herbs prove their efficacy, this review is about their blended work in various aspects of lactation and the expected results. This review finds a relevance to signify the importance of the synergestic blend of Galacto powder from the herbs presenting enhanced lactation, prevention and correction of lactational issues, an innovative area for more futuristic research too.

Keywords: *Agalactia; Cattle lactation; Galactogogue; Lactiferous tissue; Milk fever; Phytogenic; Postpartum.*

1. Introduction

Milk production, in the livestock or cattle is essential for optimal feeding of the young, having a direct impact on its growth, development and health. The many postpartum conditions after the birth lead to a decrease in the lactation [1-3]. the major conditions like animal is in oestrus, nutritional disorders, endometrits reproductive complications, systemic diseases, death of calf and consequent milk let down problem, Milk fever and acetonemia, agalactia, hormonal imbalance, oedema and congestion, endo toxicity, heat stress, worms especially Fasciolasis, Strongylosis etc. All these situations lead to the need for the development of the synthetic galactogauges, that include metoclopramide and domperidone, which work by interacting with dopamine receptors to increase prolactin levels, while over a period of time they have developed some kind of a resistance and their ill effects on the mother mainly. Hence the herbal alternatives, these rely on the new trend of organic dairy farming in the dairy industry. This has induced researchers with a keen interest in traditional herbs, because these are easily available, cheap and with a hope that they may not leave any toxic residues in milk. The Greek term “galacta” means milk, and “agogue” means stimulating substance [4]. Hence Galactogauges are referred to as “lactation supplements” or “milk boosters” used to induce, maintain, and increase milk production. Galactogogues are substances that increase milk production by altering the hormones that regulate lactation, particularly prolactin and oxytocin. Galactagogues stimulate and Increase milk production, improve udder and reproductive organ health, help treat subclinical mastitis and agalactia. Galactogogues in the first place stimulate the increase of prolactin by their interaction with

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dopamine receptors and thereby augmenting milk supply [5]. Most of the synthetic galactogogues induce an adverse effect on the neuro-endocrine activity of lactation mechanism apart from the deleterious effects of the prolonged effects of these on the mother animal.

2. Lactation Related Factors and Problems

Oxytocin Hormone secreted by posterior pituitary, its secretion is stimulated by the sensory stimulation from cervix, vagina and the udder suckling. It initiates the myoepithelial cells surrounding mammary alveoli to contract leading to milk ejection [6-9]. Cows release about one-third of their oxytocin at milking, this decreases from early to midlactation and increase from mid to late lactation and then late lactation to involution. Stabilizing this milk production is the fundamental problem. Milk let down reflex reduction, this may be either due to hormonal causes or psychological abnormalities (Figure 1).

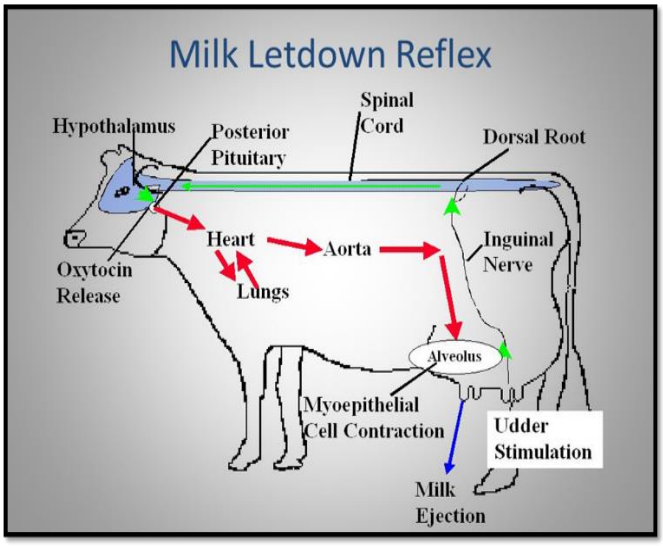

Figure 1 Milk Let Down Reflex

Agalactia is the absence of milk secretion in a female that has just given birth [10]. It represents either a failure of milk production or failure of the release of milk into the teat canal or a complete failure of the mammary glands to develop (Figure 2). Generalized debilitating conditions, such as infection of the uterus, mammary glands, or other systemic organs and nutritional deficiencies can lead to agalactia [11].

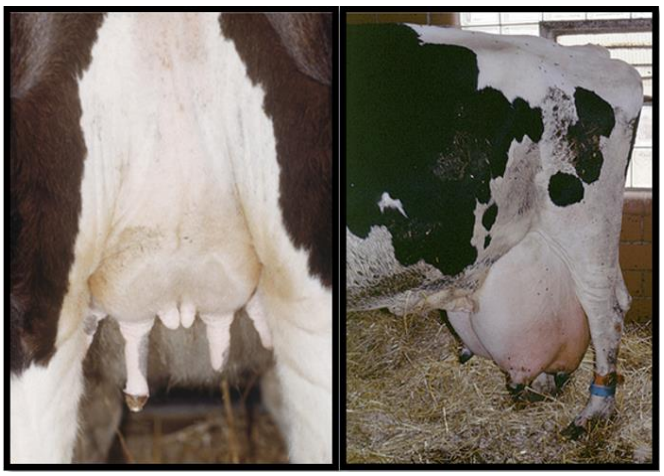

Figure 2 Udder Problems in Cow After Parturition

Heat stress or summer stress can reduce the immunity and lactation in post parturition conditions (Figure 3).

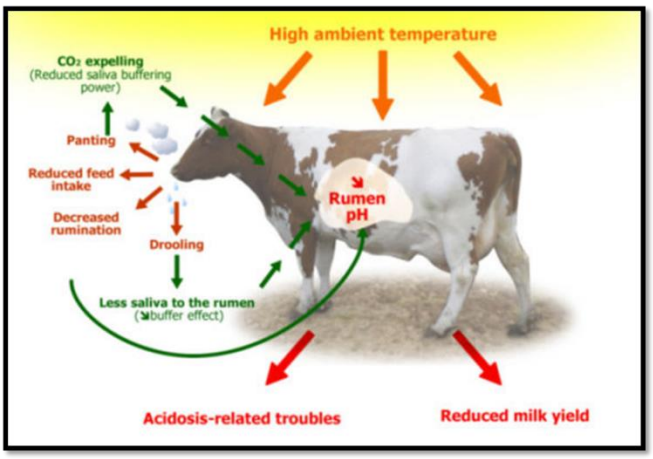

Figure 3 Summer Stress in A Cow and Subsequent Drop in Milk Production

3. Phytogenic Galactogagues Significance

Quoting Turkyilmaz et al. work that suggests the herbal galactogogues effect could be mediated by phytoestrogenic action and that some molecules may have effects similar to 17β-estradiol (E2), an endogenous estrogen that promotes the lactogenous alveoli to proliferate and work efficiently [12]. The supply of genistein (isoflavone phytoestrogen) induces mammary gland hyperplasia. Herbal galactagogues have psychological benefits too which is most needed for lactating mother. These are

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safe with reported efficacy [13]. Though the mechanism of galactagogue herbs is largely unknown, but a review by Westfall (2003b) noted that commonly used herbs were able to stimulate blood flow to the udder and teats, were oxytocic, provided a rich source of fatty acids or directly increased mammary tissue [14].

4. The Herbal Galactogogues of Prominence as Per Stated Studies

- **Asparagus Racemosus:** (Shatavari) of Asparagaceae family includes steroidal saponins, shatavarin I, shatavarin II, shatavarin IV alkaloids, proteins, starch and tannins. Isoflavones including 8-methoxy-5,6,4'-trihydroxyisoflavone 7-O- Beta-D-glucopyranoside and Asparagamine, a polycyclic alkaloid
- **Leptadenia Reticulate:** (Jivanti) of Apocynaceae provides minerals, vitamins and other valuable nutrients.
- **Breynia Patens:** (Kamboji) of Euphorbiaceae includes reducing sugars, phenolics like gallic acid, ellagic acid, coumaric acid, ferullic acid and vanillic acid, alkaloids, tannins, glycosides, flavones and saponins [15].
- **Galega Officinalis** (Goat's Rue) of Fabaceae contains galegine, peganine, vasicinone, luteolin, carnavine, saponins, flavonoids, tannins.
- **Silybum Marianum** (Milk Thistle) belongs to Asteraceae family. Its main composition is Silymarin which has excellent hepatoprotective property, toxin elimination, bile activity and others are alkaloids, reducing sugars, flavonoids, phenolics, saponins and steroids.
- **Foeniculum Vulgare** (Fennel) of Umbellifers contains rosmarinic acid, chlorogenic acids as major phenolic compounds, quercetin and apigenin as the major flavonoids. It is rich in vitamins and minerals
- **Trigonella Foenum Graecum** (Fenugreek) of Fabaceae contains flavonoids, alkaloids, coumarins, vitamins, saponins, alkaloids like trigonelline and coumarins like cinnamic acid and scopoletin.
- **Pimpinella Anisum (**Anise) of Apiaceae including the main oil constituents trans-anethole and estragole.
- **Moringa Oleifera** (Drumstick) of Moringaceae is rich in protein, vitamin and minerals like calcium. It also contains vanillin, omega fatty acids, carotenoids, ascorbates, tocopherols, beta-sitosterol, moringine, kaempferol, and quercetin.

5. The Synergism of Galacto Powder Blend

Asparagus racemosus ‘s phytoestrogenic properties that increase the size of mammary glands, increase milk secretion and inhibit involution of the lobuloalveolar tissue to maintain milk secretion. Its galactogogue activity enhance milk production by the facilitation of the lacteal alveoli. Very helpul in the control of lactational failures. Leptadenia reticulate has restorative and stimulative properties that stimulate the lactogenous alveoli for enhanced lactogenesis, it also improves the fat content of the milk also improving the milk production. It also acts as an antioxidant, immunobuilder, vitalizer and immunobuilder. Breynia patens, improves the milk quality and production, handles milk let down. It acts as an anti-oxidant and hepatoprotective. Galega officinalis (Goat's Rue) Its lactogenic value is reported to increase the milk yield and lactation persistency, possesses phytoestrogens that influence the quality and quantity of milk production. Has an important role in stimulation of milk let down. It stimulates the adrenal gland, pancreas and acts as a hepatoprotectant. Silybum marianum shows estrogenic effect, has lactogenic activity improving the quality and quantity of the milk production, improves physiological status of the cow after calf delivery by enhancing its feed intake, better absorption of fat soluable vitamins, improving the liver health, leading to faster recovery. Foeniculum vulgare is an estrogenic, increases milk production and milk fat content. It has properties of blood purifying, tissue water retention balance, respiratory health, anti-flatulance and digestion improvement. Trigonella foenum graecum has phytoestrogens mainly Diosgenin that have mastogenic effect,

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stimulating the growth of mammary gland, milk production and maintenance of lactation. It also improves the reproductive cyclicity and faster recovery after calf birth. Pimpinella anisum as a Galactogague possess strong estrogenic activity that significantly increases milk production. It possess digestive stimulant, carminative and expectorant activity. Moringa oleifera as a Galactogogue increases both quality and quantity of milk production. It helps in recovering agalactia, hypogalactia and milk let down related issues. Also improves bone health and digestion stimulation. An add on in this Herbal combination, the yeast Sacchromyces cereviseae yeast. Acting as a binder It has properties like improvement in microbial digestion, overall health, immune function, intestinal integrity, pathogen inhibition and nutrient absorption. Due to above functions there is an improvement in milk production and milk fat. It helps in maintaining the body metabolism and faster recovery from the postpartum tanturms.

6. Working of Phytogenic Galactogogue

The postpartum conditions are a complex neurophysiological processes that involve interaction of a number of physical and emotional factors along with action of multiple hormones, mainly prolactin. During parturition and expulsion of the placenta, progesterone concentration reduced resulting in initiation of full milk supply. Dopamine agonists and antagonists regulate prolactin synthesis and secretion through interaction with the hypothalamus and anterior pituitary and thereby control milk production. Thereafter, prolactin levels gradually decrease but milk supply is maintained or increased by local feedback mechanisms. For the lactating cows both Lactogenesis and ejection are stressful. The working initiated by stimulation of blood flow to the udder and teats, providing a rich source of fatty acids to increase the mammary tissue. Lepidium sativum increases the percentage of lactose and SNF (Solid Not Fat) in milk. Fenugreek stimulates mammary tissue growth and provides hormonal support. Goat's rue is helpful to handle mammary hypoplasia. Fenugreek acts as ruminotoric and increases blood flow to the mammary gland improves postpartum hemorrhage. Fennel, promotes milk ejection, stimulates milk flow, and increases udder milk production (Figure 4). Goat's Rue regulates estrogen levels. Asparagus, Pimpinella, Borago, Foeniculum, Trigonella are Estrogenic and lactogenic , that also stimulate prolactin release. Asparagus increases weight of the mammary glands, inhibits involution of lobulo-alveolar tissue and maintains milk secretion. Silybum, Asparagus help the uterus to recover, regain its size and shape quickly following parturition. Estrogenic effect. Alkaloids Isoflavones of the herbals Increase milk yield as well as fat, protein and lactose percentage of milk. Polyphenols Improve milk yield, concentration of milk protein, prevent bloat in cattle, reduce gastrointestinal issues related to postpartum. Saponin are ruminotoric, improve rumenal health. Tannins are antihelmintic and ruminotoric, improve protein digestion mainly. Many of these herbs stimulate mammary growth Provide hormonal support.

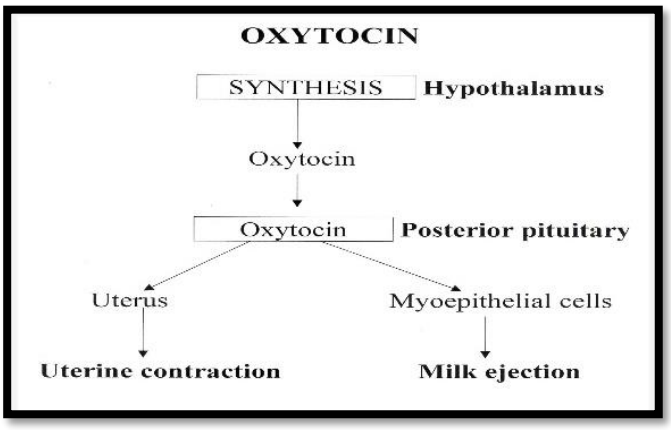

Figure 3 Working of Phytogenic Galactogogue

Conclusion

The little research study supports the effectiveness of phytogenic Galacto powder, the Galactogogue as lactation supplement. It has an incredible psychological effect, improving mother's nursing and milk supply. This phytogenic galacto supplement including fenugreek, milk thistle, anise, fennel etc. prove its actual working, safety and effectiveness. This Galacto powder seems to have overall effects like normalizing effect on progesterone, pituitary gland functioning,

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stimulating prolactin production, as a uterine tonic, anti-spasmodic, anti-inflammatory, Carminative, emmenagogue, , oxytocic, antipyretic handling milk fever , stimulates lactiferous tissues of mammary gland, promoting milk ejection, correction of lactational issues , hence an efficient galactogogue.

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