Phytogenics to Manage Reproductive Disorders in Ruminants

Introduction:
The most important objective of any species on this planet earth is self-perpetuation. Reproduction is the tendency of a species to produce individuals of its own kind. A sound reproductive process and system of the body, be it in humans or animals, depends upon a number of factors. Reproductive disorders are one of the most critical problems that reduce the production and productivity of dairy cows. Failure in the reproduction process leads to great economic losses to farmers involved in the livestock sector. Generally, common reproductive disorders which are found in the ruminants include infertility, anoestrous, repeat breeding, endometritis, retained placenta and abortions etc. Anoestrous and repeat breeding are two very serious reproductive disorders affecting nearly 30-40% of the total cattle and buffalo population. Reproductive disorders can lead to severe economic losses which are realised in terms of reduced fertility, low reproduction, longer calving intervals and elevated treatment costs in farm animals. Most of the cows and buffaloes resume the oestrous cycles post parturition, within the first month of calving, failure of which is the main reason for delay in conception.

The success of a dairy industry depends on the reproductive performance of its cows so as to meet the growing demand for milk and milk products. The lactation cycle of a cow depends upon the cow’s reproductive ability to get pregnant. The chemical mediators called hormones, released during and after pregnancy, are required for the proper development of the mammary gland and the production of milk-producing cells in the alveoli. The important hormones like prolactin and somatotropin shut down the hormones needed for reproduction of the animal and growth of the ovarian follicles. These hormonal actions are much needed for maintaining the production and reproduction processes in the animals.

If reproductive disorders are diagnosed at the proper stage, their management can be easier, but in general, the reproductive disorders go unnoticed until they are established in the herd. It is important for the farm owners and producers to have a treatment and prevention programme after discussing with their veterinarian, nutritionist, and herd managers to control and prevent reproductive problems among the animals of the herd.

Cows in proper health come in oestrus more frequently and have a higher conception rate, have reduced cull rates, and have greater production of milk when compared with other unhealthy herd animals.

The use of chemicals or antibiotics to manage reproductive disorders is the practice which has been going on for many years, and even today allopathy is the major system of medicine followed by many. Irrespective of several hazards associated with these chemicals and drugs, people use these products because of the lack of a suitable alternative which is natural and safe. The dangers (e.g. development of bacterial resistance) which have arisen due to the use of such harmful chemicals and antibiotics have even alarmed the scientific community into thinking about an alternative cure.

Ayurveda is a science utilising the natural power of herbs to prevent and cure a number of ailments in humans and animals, which is not only effective but also natural and safe. A number of herbs are found to have remarkable medicinal properties to counter different reproductive disorders (e.g. anoestrous, repeat breeding, endometritis, retained placenta and abortions) in animals.

Major Reproductive Disorders:
Anoestrous:
Anoestrous is the lack of periodic manifestation of oestrus by animals. There may be the absence of palpable follicular or luteal structures over the surface of ovaries leading to the absence of normal physiological signs of oestrus associated with corpus luteum (suboestrus, physiological anoestrous). Anoestrous may be caused by many factors associated with management, nutrition, breeding, hormonal imbalance, etc. Eliminating such factors will prove useful in reducing anoestrus in cows and buffaloes with varied degrees of success.

Retained Placenta / Retention of Fetal Membrane:
The placenta is a connecting link between dam and fetus. It is a membrane that transfers nutrients from the dam to the calf during pregnancy. Generally, a cow pushes out its fetal membranes by six hours, and some even after 12 hours of parturition. The retention of fetal membranes after 12 hours has several ill effects on reproductive performance of the animal. Many postpartum diseases, reduced milk production, etc. may be its immediate consequences. Retained placenta condition is of two types, namely primary or secondary retention of placenta. The primary retention of placenta is due to a lack of detachment from the maternal caruncles, whereas secondary retention is as a result of a mechanical difficulty in expelling fetal membranes which has been already detached. An average of 40 days is taken by the uterus in normal cows to return to its normal size. However, in cows with retained placenta, it takes more than 50 days for the uterus to return to its normal size. Retained placenta is associated with abortion, dystocia, and multiple births.

Infections:
Most commonly, uterine infections are seen in ruminants during the post parturition period. Many specific infectious conditions have a severe impact on production and reproductive performance of the animals like dystocia, endometritis, and retained placenta. The vulva along with the vestibular sphincter and cervix protect the uterus from...
infections caused by bacteria. However, during and after parturition, the protection barriers that save the uterus are broken, which allows many pathogenic and non-pathogenic bacteria to enter into the reproductive tract of the cow. The organism most commonly associated with uterine disease in cattle is *Actinomyces pyogenes*. In addition, the gram-negative anaerobes *Fusobacterium necrophorum* and *Bacteroides melaninogenicus* are frequently associated with *A. pyogenes*. Unhygienic calving conditions and traumatic obstetric techniques predispose the animals to uterine infections.

**Endometritis:**
Endometritis is defined as “inflammation of the endometrium”. Endometritis occurs after giving birth, artificial insemination, or infusion of irritants into the endometrium. Major symptoms of endometritis are purulent exudate of the vulva and vaginal discharge. Subclinical endometritis cannot be detected by rectal palpation and no vaginal secretion is observed; however, it can be detected by microscopic examination of uterine tissue. Endometritis can be caused by bacteria or fungi that enter the uterus during calving or after calving. The most important cause of endometritis is non-specific opportunistic pathogens that contaminate the uterus during the peri-parturient period.

**Repeat Breeding:**
A repeat breeder is generally defined as a cow or buffalo that has not conceived after three or more services associated with true oestrus. A repeat breeding animal has normal or nearly normal oestrus cycles and genital tract, and even though it had been bred three or more times by a fertile bull semen had failed to conceive. It is always difficult to diagnose the exact etiology of repeat breeding since many factors can, and mostly do, contribute to a failure to get conceived or maintain full-term pregnancy. The cause may be a herd problem or an individual cow problem. Herd problems are generally most common, and mainly are inadequate oestrous detection, semen quality and insemination techniques. Individual cow factors include metritis and/or endometritis, cervicitis and/or vaginitis.

Some other common problems leading to repeat breeding and reproductive disorders include hormonal problems like cystic ovarian disease, delayed ovulation, blocked oviducts, anatomical deformity and defects of the genital tract, as well as early embryonic mortality.

**Phytogenics:**
The history of the use of herbs for curing reproductive disorders started centuries ago and even today it is been used effectively against various reproductive affections. The obvious reasons of not going for antibiotics (e.g. development of bacterial resistance) and other chemicals to treat such cases have led to an increased demand for an alternative therapy. A number of herbs are known to possess excellent properties to cure such reproductive problems.
**Plumbago zeylanica**: It is a member of Plumbaginaceae and is commonly known as “Ceylon leadwort”. It is found to have uterine stimulant activity and stimulates the muscular tissue of the uterus. It also has antibacterial and anti-inflammatory actions. It has some tendency to induce uterine contractions, i.e. can be used as an ecbolic.

**Leptadenia reticulata**: A member of Asclepiadaceae, popularly called “Jivanti”. It has uterine stimulant and uterine tonic activity. It also helps the animal to restore a regular oestrus cycle. It provides nourishment to the reproductive system of the body of the animal.

**Aristolochia indica**: A member of Aristolochiaceae, popularly known as “Indian birthwort”. The plant is mainly found in Sri Lanka, Bangladesh and southern parts of India. The plant has for a long time been used as a traditional medicine for post-delivery infections.

**Citrullus colocynthis**: Also known as “Bitter apple”, a member of the family Cucurbitaceae. It is found to mimic gonadotropin-like activity, synchronises the release of reproductive hormones and induces oestrus in animals.

In a nutshell, it can be concluded that herbs have a very crucial role to play in the maintenance of reproductive health of ruminants. It not only brings about improved reproductive performance but also ensures a natural, safe and sustainable solution to farmers of the present generation.

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**Scientific Validation:**
A field trial was conducted to test the efficacy of three different herbal products (Ayurvet Limited, India) prepared from these herbs as their key ingredients. A brief summary to explain the trial and its results is as follows:

<table>
<thead>
<tr>
<th>Disorder type</th>
<th>No. of animals suffering</th>
<th>No. exhibiting cyclicity after treatment</th>
<th>Clear nature of discharge after treatment</th>
<th>No. of animals conceived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention of Placenta</td>
<td>4 (4.49%)</td>
<td>4 (100%)</td>
<td>3 (75%)</td>
<td>3 (75%)</td>
</tr>
<tr>
<td>Anoestrous</td>
<td>67 (75.28%)</td>
<td>64 (95.52%)</td>
<td>60 (89.55%)</td>
<td>57 (85.07%)</td>
</tr>
<tr>
<td>Endometritis</td>
<td>11 (12.35%)</td>
<td>9 (81.82%)</td>
<td>7 (63.64%)</td>
<td>5 (45.45%)</td>
</tr>
<tr>
<td>Repeat Breeding</td>
<td>4 (4.49%)</td>
<td>2 (50%)</td>
<td>1 (25%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>Infertility</td>
<td>3 (3.37%)</td>
<td>1 (33.34%)</td>
<td>2 (66.67%)</td>
<td>1 (33.34%)</td>
</tr>
<tr>
<td>Total no.</td>
<td>89</td>
<td>80 (89.9%)</td>
<td>73 (82.02%)</td>
<td>67 (75.52%)</td>
</tr>
</tbody>
</table>

# Results of a field trial done in India (2013)

The combined therapy was found to improve estrus inducing activity and conception rate and also successful in treatment of retained placenta and endometritis.

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