

Strategic treatment approach

to common reproductive problems in livestock

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Indian dairy is an epitome of rural industry where marginal, small and medium dairy producers contribute to the national milk pail that is collected, pasteurized, pocketed and marketed by a multitude of government, cooperatives, private chilling and processing centres. Under these production settings, it is difficult to ascertain the prevalence of infertility with its causes in the cow due to lack of records and deregulated movement of animals among the clients. Here, an attempt has been made to compile the strategic treatment approach for anoestrus, repeat breeding, metritis complex (RFM, metritis, endometritis and pyometra complex) and cystic ovarian disease (COD) which have major impact on economy of the farmers through antagonizing fertility of dairy animals.

Key words: Dairy, Infertility, Metritis complex, Repeat Breeding Syndrome

HETEROGENEITY in the production potential of the breeds, seasonal variations in feed and fodder availability and lack of uniformity in climatic condition at different regions prohibit the development of uniform strategy both management and therapeutics for the infertility problems. As a consequence, addressing even the nutritional, management and other production related issues of infertility is largely on the basis of individual cow therapy rather than herd medicine. This has negative consequence as it reduces the profit margin of dairy producer by increasing the veterinary costs. However, strategic treatment approach towards various reproductive problems can alleviate the problem without affecting general well-being, fertility and productivity of animals.

Anoestrus is one of the most common reproductive problems in cattle and buffalo in India, which causes overt and insidious economic losses. It is a functional reproductive

disorder which is characterized by absence of overt signs of estrus whether the animal is cyclic or acyclic. It can be classified as physiological and pathological conditions. Physiological anestrus includes prepubertal, gestational and first 3 weeks of post-partum. Pathological anestrus is due to congenital anomalies like ovarian hypoplasia or aplasia, freemartinism, uterus unicornis; uterine pathologies

like fetal mummification and pyometra as well as hormonal problems like cystic ovarian disease. Uterine infections in the postpartum cow delay involution and resumption of normal ovarian cyclicity. In the sub-urban and rural areas of the country, low plane of nutrition, poor housing, lack of green fodder and grazing resources are the major factors associated with acyclicity; however, heat detection efficiency is



less likely cause, as the farmer spends time everyday with the animal for feeding, milking and cleaning the shed. Reproductive efficiency in the buffalo appears to be limited on account of three distinct inherent problems such as delayed puberty, prolonged postpartum anestrus and summer anestrus. The reported incidence of anestrus or lack of estrus expression varies from 9.1-69.4% in the buffaloes. Incidence of anestrus is more in the buffalo than that of cow due to preponderance of silent heat/subestrus and summer anestrus as compared to cattle.

Strategic treatment approach

- First to rule out whether the animal is pregnant or not, per-rectally or through ultrasonography (USG) before starting any treatment.
- Then, per-rectal examination/ USG of reproductive tract to know the status, true anoestrus follows three types-
 - (i) Pea shaped ovary and normal genital tract
 - (ii) Normal ovary with infantile genitalia
 - (iii) Pea shaped ovary along with infantile genitalia
- In these conditions, concentrate feeding, deworming and mineral mixture (cyclomin 7 bolus) supplementation along with herbal heat inducers like Prajana HS (Indian Herbs, Natural Remedies), Janova (Dabur, Ayurved), Fertivet (Ar Ex Labs), Sajani (Sarabhai), Heat-Up (Century) and Heatraj (Rajan); and Vitamin C tabs should be given to the affected animal for at least 21 days and advised owner to closely observe signs of estrus and do artificial insemination (AI).
- Hormonal therapies like GnRH injections are considered to be effective to induce estrus in delayed pubertal/pubertal anestrus heifers which attain sufficient body weight and show proper genital structures on transrectal palpation. Pubertal heifers having poorly developed genitalia should be kept on a high plane of nutrition along with multivitamins and mineral supplements before initiating hormonal therapies.
- Active ovary with palpable follicles

and corpus luteum (CL), then to find out whether it is cyclic CL or persistent CL on continuous observation through per rectal/USG examination.

- Active ovary with palpable follicles and cyclic CL, then condition of silent heat or subestrus; then treat accordingly in cattle or in buffaloes.
- Silent heat classically seen in buffaloes, treatment includes summer management like use of water sprinklers or foggers and provision for shaded area to protect from heat stress
- Hormonal therapy for silent heat includes melatonin, estrogen and GnRH injections with variable results in field.
- Silent heat or unobserved estrus might be due to short estrus duration missed due to human error in detecting animals in heat. In such conditions, increase the frequency and duration of estrus detection as well as use the heat detection aids for efficient estrus detection in farm conditions.
- In persistent CL (life of CL more than normal) conditions like pyometra, fetal mummification and other pathological conditions, administration of PGF₂ alpha injection (cloprostenol) is must.
- Anoestrus due to cystic ovarian disease, under field condition, best treatment is GPG protocol along with progesterone implant (CIDR) for 7 days between first GnRH injection and PGF₂ alpha injection if not able to differentiate between follicular and luteal cyst.
- Experienced vets with the use of USG if differentiate the cystic conditions, then, for follicular cyst, administers GnRH injection alone or with PGF₂ alpha injection at 7 days interval; or progesterone implant for 7- 9 days.
- In case of luteal cyst, administration of PGF₂ alpha injection. (cloprostenol) is must. Advised for skip a heat with AI done at next observed estrus.
- Most of the peri-parturient diseases and pathological post-partum anoestrus can be prevented if dry cow nutrition and management are well attended during transition period to avoid negative energy

balance.

Repeat breeding syndrome (RBS)

One of the unmanageable reproductive problems in the dairy cattle prevalent at field level is existence of a large number of repeat breeder cows. It is a globally frustrating fertility problem, and even in the best managed herds, RB is bound to occur and an incidence of 3-5% can be tolerated. According to the established tenets, a repeat breeder is a cow or buffalo that has normal estrous cycle, is free from palpable clinical abnormalities, has no abnormal vaginal discharge, is less than 10 years old, has calved at least once but has failed to conceive after at least three or more consecutive inseminations. It is basically a diagnosis of exclusion and in a simpler term, repeat breeding animals come to heat regularly within 18-24 day interval; but, fail to conceive after breeding. RB causes financial loss in terms of repeated inseminations, treatment, cost of feeding without production and days open. Genetics, age, subclinical endometritis, delayed ovulation or anovulation, luteal insufficiency, malnutrition and improper AI technique are associated with RBS that ultimately results into fertilization failure or early embryonic death (EED). EED mostly occurs between 8-16 days of gestation during which period blastocyst elongation and maternal recognition of pregnancy occur. It is also one of the major reproductive problems in the buffalo, although the reported incidence is 8.68% as compared to 18.79% in the cow.

Strategic treatment approach

- When a repeat breeder cow is presented, then nutritional aspects as well as managerial aspects should be asked to the owner and approached first, then treated accordingly by increasing concentrate feeding, mineral mixture (trace elements) and stress relief herbal preparations like stresschek, restobal or vit C tab (Celin® tab).
- Per-rectal examination and with USG, tubal patency and ovario-bursal adhesions if present should



be checked and excluded before following any treatment approach.

After that, owner should be asked for heat duration the animal showed in past estrus cycles, and AI done with semen of fertile bull by well trained inseminators to rule out poor semen quality, improper handling of semen (thawing of frozen straws), improper time and place of semen deposition by untrained personnel.

- To synchronize insemination and ovulation in delayed ovulators or anovulators, any of these three approaches can be followed.

- 1) Two times insemination at 12-24 hrs intervals,
- 2) Delayed insemination at the end of estrus with two doses of AI,
- 3) Injection GnRH (2.5 mL) IM after insemination of presented animal in estrus.

- In order to treat suspected cases of subclinical endometritis, it is better to infuse any intrauterine antibiotics

animal doesn't conceive, then, it might be the case of luteal insufficiency/deficiency which is corrected by administration of one of the following:

- 1) GnRH injection at the time of insemination and at day 11-13 post AI.
- 2) hCG injection (3,300 IU) on 5th day post AI as benefits of hCG or GnRH therapy was postulated to be because of formation of accessory corpora lutea.
- 3) Progesterone supplemented as a single IM injection (500 mg) on day 5 post AI or progesterone vaginal implants from day 5 to 12 of AI.
- 4) Recombinant bovine somatotropin (500 mg SC) at the time of oestrus and 10 days later significantly increases the conception rate because of increase in circulating progesterone.

like Lenovo- AP®, Lixen® IU or Cflox-tz® IU at minimum 24 hrs interval from insemination.

Alternative approaches like

1) Infusion of intrauterine antibiotics in animals presented at estrus, then advised for AI at next detected heat.

2) If the presented animal is in diestrus, then Injection PGF₂ a l p h a (cloprostenol) is administered and after 2-3 days, intrauterine antibiotic preparation is infused; advised for AI at next detected heat.

- If after attempting all these approaches,

Metritis complex (RFM, metritis, endometritis and pyometra complex)

Retention of fetal membranes (RFM): Fetal membranes do not expel till 8-12 hrs after parturition.

Strategic treatment approach

- It should be left untouched up to 24 hrs after parturition and, then, removal of easily detachable fetal membranes is carried out gently without any force.
- After that, herbal uterine cleansers like Exapar®, Uterotone®, Utrifit® or hormotone® should be prescribed.
- In dystocia cases, after removing the fetus systemic antibiotics can be administered if the animal condition is likely to be compromised.
- Use of intrauterine antibiotics should be strictly prohibited until and unless any uterine infections are present.
- Forcefully, removal of fetal membranes should not be done as it causes severe hemorrhages and increases chances of uterine infections due to compromised uterine defence mechanism.
- Ecboolics like Oxytocin, PG and estrogen preparations has been prescribed without much beneficial effects.

Metritis- Also known as puerperal metritis generally seen within 10 days of parturition characterized by systemic signs of illness, fever, dullness, fetid watery reddish brown uterine discharge, an atonic grossly enlarged uterus, toxæmic diarrhea and finally death of animal due to endotoxic shock.

Strategic treatment approach

- Good nursing care and vigorous medication.
- Intensive fluid therapy and administration of Flunixin® injection (2.2 mg/kg) IM to stabilize the animal first.
- Thereafter, systemic antibiotic therapy like Ceftiofur® and OTC injection are given.
- Intrauterine antibiotics are of little use and Estrogen injection is contraindicated.

Endometritis

Endometritis is defined as the localized inflammation of the mucosal layer of the uterus that commonly occurs following calving, coitus or unhygienic artificial insemination in the cattle and buffalo. This implies that endometritis is an essentially ascending infection of the uterus that occur when the cervix is patent. Postpartum endometritis may be clinical or subclinical with the former condition characterized by purulent, mucopurulent or flaky whitish genital discharge after day 25 postpartum, whereas subclinical endometritis is insidious and is a diagnostic challenge. Predisposing factors that are associated with the development of endometritis include dystocia, abortion, retention of fetal membranes, puerperal metritis, twinning, increased parity, high milk yield and season of calving. Subclinical endometritis is a major threat to dairy sector as there is no visible abnormal vaginal discharge and being important cause of embryonic mortality and repeat breeding in the dairy cattle. The incidence of endometritis is 9.1-67.11% in the buffalo which is higher than that of the one reported in the cow. Poor hygiene, vaginal stimulation for milk let-down and wallowing are believed to increase the risk of endometritis in the buffalo.

Strategic treatment approach

- For clinical endometritis, first uterine lavage with high volume of normal saline mixed with betadine® to remove most of the pus flakes or uterine contents.
- Then, intrauterine antibiotics like Lenovo- AP®, Lixen® IU or Cfloxtz® IU should be prescribed for 5 days.
- Injection PGF₂ alpha (cloprostenol) IM can also be administered.
- For subclinical endometritis, intrauterine antibiotics should be prescribed for 5 days. Other treatments for this condition
- Autologous blood plasma. Dose: 40-50 ml 2 times at 24 hr interval, (ii) Colostral whey. Dose: 40-50 ml IU 2 times at 24 hrs interval, (iii) 100 µg or 200 µg *E. coli* LPS in 20 ml distilled water 2 times at 24 hrs

interval, (iv) Alcoholic extracts of chamomyle, marigold, comfrey, salvia and yarrow plants, (v) Neem oil. Dose: 40-50 ml IU 2 times at 24 hrs interval, (vi) *Tinospora cordifolia* (aqueous extracts). Dose: 50 ml (3000 mg total dose) IU for 3 consecutive days, (vii) Turmeric and garlic extracts, (viii) Antifungal agents *i.e.* *Rosemarinus officinalis* and *Thymus vulgaris* against mycotic endometritis.

- For pyometra, Injection PGF₂ alpha (cloprostenol) IM should be administered.

Then after 2-3 days, uterine lavage along with intrauterine antibiotics infusion for 5 days.

Cystic ovarian degeneration (COD)

In the developed countries like USA, there is convincing data that increased genetic selection for milk yield has adversely affected the economically important reproductive traits. Similar trend has also been perceived in the crossbred cows of organized herds and Government owned farms of India. One of the most common ovarian dysfunctions associated with high milk production is the formation of cystic follicle due to ovulatory failure during day 30-60 postpartum.

Ovarian cysts are characterized as pathological structures greater than 2.5 cm (approximately 1 inch) in diameter but, if multiple >1.7 cm in diameter which persist on an ovary for more than 10 days with the absence of corpus luteum. Major categories of cysts include follicular cysts, luteinized follicular cysts and cystic corpora lutea in which follicular cysts and luteinized follicular cysts are pathological structures with more incidences of follicular cysts in animals. Luteinized cysts are firmer to the touch per-rectal examination of ovary and >2.5 cm in diameter with wall thickness >3 mm and mostly differentiated by ultrasonography on the basis of wall thickness from follicular cysts. Predisposing factors are hereditary predisposition, breed, age, milk yield and nutrition, season, ketosis, dystocia, RFM, milk fever and postpartum uterine infections. In India, the incidence of follicular cysts has

been reported 0.5–2.7% in cattle, 1.26–3.4% in buffaloes, and 8.0–10.2% in crossbred cattle; whereas incidence of luteal cysts are 1.45–3.0% in cattle, 0.66–12.5% in buffaloes, and 9.0–13.3% in crossbred cattle. Though the incidence is low in the buffalo, most of the cystic conditions remain undetected because of inherent property of less nymphomaniac and homosexual behavior seen as compared to cattle.

Strategic treatment approach

- If not able to differentiate between follicular and luteal cyst through per-rectal examination and if USG facility is not present, best treatment is GPG protocol along with progesterone implant (CIDR) for 7 days between first GnRH injection and PGF₂ alpha injection.
- Experienced vets with the use of USG if able to differentiate the cystic conditions, then, for follicular cyst, administer GnRH inj alone or with PGF₂ alpha injection at 7 days interval; or progesterone implant for 7- 9 days.
- In case of luteal cyst, administration of PGF₂ alpha injection (cloprostenol) is must. Advised the owner to skip a heat with AI done at next observed estrus.
- Some veterinarians also perform cyst ablation through transvaginal ultrasonography.
- Negative energy balance predisposes peri-parturient diseases and later COD condition which can be prevented if dry cow nutrition and management are well attended during transition period.

Hormonal preparations used in strategic treatment approach

- 1) Receptal VET® (Intervet), Ovulanta® (Vet Mankind), Gynarich® (INTAS Pharma), Pregulate® (Virbac) as GnRH analogs are used for the treatment of follicular cysts (5 mL) IM, anoestrus (5 mL) IM, delayed ovulation (2.5 mL) IM, sub-oestrus (2.5 mL) IM and repeat breeding disorder (2.5 mL) IM.
- 2) HCG preparations having LH like activity such as Chorulon® (Intervet), Folyson® (Indian

Immunologicals) are used in the treatment of follicular cysts, anoestrus, delayed ovulation, anovulation and repeat breeding disorder.

- 3) Oxytocin preparations like Pitocin® (Pfizer) and Syntocinon® (Novartis) are used in RFM and for post-partum uterine involution.
- 4) PGF₂ alpha (natural) such as Lutalyse® (Pfizer), Dinofertin® (Alved) as well as synthetic preparations like Vetmate® (Vetcare), Clostenol® (Zydus AHL), Pregova® (Virbac),

Repregna® (Vet Mankind), Pragma® (Intas), Cyclix® (Intervet), Oestrushot® (Novartis), Estrumate® and Illiren® (Hoechst, Germany) are used in pyometra and luteal cyst conditions.

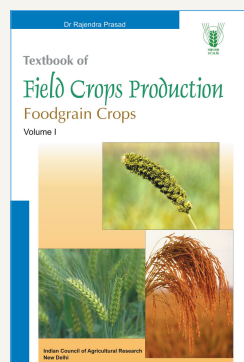
- 5) Estrogen preparations like Progynon Depot® (Zydus) and Pregheat® (Virbac) are used in anoestrus, sub-oestrus and RFM.
- 6) Progesterone preparations like Duraprogen® (Vetcare), Comshot® (Novartis), Hyprogen® (Vets Pharma) and proluton Depot® (German remedies) are

used in repeat breeding and post-partum anoestrus. Progesterone preparations as ear implants such as Crestar® (Intervet), Syncro-Mate-B® and intra-vaginal implants such as CIDR®, PRID® and TRIU-B® (Virbac) can also be used.

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Textbook of *Field Crops Production* – Foodgrain Crops

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TECHNICAL SPECIFICATIONS

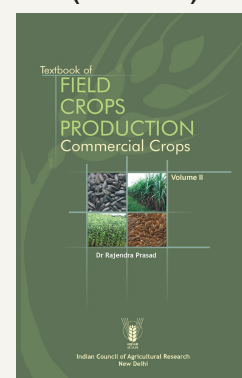
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