THERAPEUTIC MANAGEMENT OF ANOESTRUS IN FARM ANIMALS

Anoestrus is the major infertility problem in farm animals. It is important to note that anoestrus is a broad term, which indicates the lack of oestrus expression at an expected time. The meaning depends on age, weight, breed and history. Delay in expression of oestrus is beyond accepted average in anoestrus. It must be understood that a period of sexual quietness in animals is shown by complete absence of oestrus cycles.

Anoestrus as fertility problem may be true when animals have small inactive ovaries with no palpable GF and functioning CL on ovary with toneless uterus on three consecutive G/C examinations at ten days interval. Anoestrus condition is physiologically expected during pre pubertal stage, pregnancy, puerperal period and senile age but all other times animal should cycle regularly and manifest oestrus.

The condition differs from suboestrus or silent oestrous. There are continuous oestrus cycles without any behavioral signs in suboestrus condition. Weak and silent heat continues unnoticed and the condition is presumed to be anoestrus. However palpable ovarian activity (GF/CL) is noticeable in subestrus.

The incidence of anoestrus in bovines is considerably high and it is a worldwide problem. Delayed maturity, post partum anoestrus and post service anoestrus leads to economic losses. The problem of anoestrus is caused by various etiological factors that are interdependent and also complicated.

The incidence and management of the anoestrus have been recognised as age old problems in cattle breeding and there is wealth of documentation on various therapies to induce estrus in cow and buffaloes.

Dr. N. M. Markandeya  
Associate Professor, Veterinary College, Udgir.

Dr. S. S. Rautmane  
Deputy Commissioner AH, DIS, Pune.
Treatment Consideration

Treatment of anoestrous depends on cause, diagnostic facility, availability of drugs, acceptability/response to the drug by the animal, dose of the drug, duration of the drug response and health status of the animal. Cost of the treatment and easy availability of drugs in the market are also important in case of rural poor.

Vague generalizations and empirical treatments are futile on many occasions. Treatment for anoestrus should not be undertaken unless body score condition and nutritive standard is optimum in animals.

Treatment of anoestrous is practiced in both therapeutic as well as preventive manner. Although vast majority cases are presented to the clinic for therapeutic course, preventive approach is expected under modern and economic dairy management.

Alleviation of all stress factors of the animal by improved managerial practices with corrections in housing, feeding, watering, grooming, exercise is highly essential at doorstep of farmer/breeder. This is possible only through mass education, veterinary extension and practical demonstrations by the veterinarian.

The first approach in the line of anoestrous treatment should be emphasized on correcting nutritive management. The optimum and balanced diet should be worked out in anoestrous cases according to the blood biochemical analysis. Unless the blood biochemical levels are optimised, no treatment should be undertaken.

The animal should first get maintenance ration for a period of fifteen days and then steaming up can be practiced with additional ration. Many animals resume ovarian cyclicity due to correction of nutritive requirements as a flushing effect.

Levels of Co, Cu, Fe and Mn have shown to be lower than normal in both anoestrous and anaemic animals and hence supplementation of macro and micro mineral nutrition is beneficial. Use of iodine, calcium, phosphorus, copper, cobalt and vitamins are commonly practiced in oral or injectable form.

Health of the animal is another important aspect in case of anoestrous. Chronic debilitating diseases should be treated first. In
particular, parasiticide spray for ecto parasites and deworming therapy should be carried out. Skin infections, wounds, allopacia should be corrected by appropriate treatments. Skin luster should return to normalcy and it should be shiny. Similarly all the clinical diagnostic indices should become normal.

**Stimulatory approach**

Ovarian massage is known to stimulate the cyclicity in some anoestrous cases. It is proved that the cervical stimulation with lugol's iodine at very low concentration as paint or intrauterine infusion gives better response in inducing oestrus.

Chemical preparations ex. clomephene citrate which has LH like effect in induction of ovulatory oestrus. Considering nonhormonal property of the drug, clomephene citrate is preferred by practicing veterinarians.

**Herbal treatments**

Animals with gaining body weights always show tendency of resuming cyclicity. Quite often it is observed that the animals with optimum health, nutrition and management also show anoestrus. These animals require stimulus and ignition like effect to start ovarian cyclicity. The required stimulus can be very well charged with herbal preparations.

Herbal therapies are cheap and they have no side effects. Similarly herbal treatments are convenient to administer (orally) and their nonhormonal properties render field vets to use them regularly. There are many herbal drugs for induction of oestrus. Herbal drugs contain various ingredients in various concentrations, all are used with a common principle of their oestrogenic property.

**Hormonal therapies**

Application of hormonal treatments in anoestrous cases should be used judiciously and only under the guidance of a trained veterinarian. Generally hormones are used for speedy results. Induction of oestrus (behavioural overt signs) should be aimed to have ovulatory response and subsequent conception. Hormonal
treatments may prove unsatisfactory and produce unexpected results if correction of managerial and nutritional errors is aimed with hormonal treatment.

Circulating levels of endogenous hormones cannot be estimated easily and repeatedly on hospital/farm levels and hence the use of exogenous hormones leads to "shooting in the dark" and the results are always valueless.

**GnRH**

Only GnRH treatments in noncyclic cattle are not much encouraging. GnRH treatment might increase the probability of maternal recognition thus reducing embryonic loss and improving pregnancy rate of preceding AI through prolonging life of CL.

GnRH treatments after a week or two after parturition gives negative effect in animals with uterine infections but positive effects with healthy uterine involution process. The application of GnRH two weeks after calving would enhance the chances of early resumption of cyclicity in post partum dairy cows.

**Gonadotrophins**

Use of gonadotrophins is of much less value in the treatment of true anoestrus. It is well established that FSH level is always optimum even in anoestrus stage. LH levels are low and episodic release is not continued in anoestrus. Since FSH and LH are protein hormones, their repeated use may possibly form antibodies.

Non pituitary gonadotrophins are preferred for the treatment of anoestrus. PMSG (FSH) and HCG (LH) are used either separately or in combination. However, exogenous LH is more commonly preferred due to low values of endogenous source or low sensitivity at ovarian level. PMSG may lead to multiple follicular developments.

**Progesterone**

Progesterone is widely used in the treatment of anoestrus with prime consideration of its safety. The withdrawal effect of the progesterone is essential for priming of hypothalamic–pituitary axis for initiation of next oestrous cycle. In true anoustrous cases, Induced
hormonal dioestrus by progestrone is suddenly ended (like luteolysis) at removal of implant/injection of progesterone and a proestrous sequence occurs spontaneously resulting in oestrus and ovulation.

In case only progesterone priming is not sufficient to induce oestrus and ovulation, gonadotrophins with long halflife (Non pituitary gonadotrophins, eCG/HCG) are essentially required.

**Oestrogens**

No pretreatment of progesterone prior to oestradiol will lead to oestrous without ovulation as there is no LH surge. Oestradiol administered after progesterone withdrawal can stimulate the onset of an ovulatory 'cascade' of LH.

Oestradiol could produce oestrus and ovulation if administered during a spontaneous proestrous following a hormonal dioestus produced by progesterone. The recognised positive feed back effects of ODB to stimulate pulsatile release of gonadotrophins can be utilized to treat successfully anovulatory anoestrus. These feed back effects occur after priming the hypothalamic pituitary system with progesterone.

**Multiple hormones**

Silastic implant impregnated with Norgestomet ie. synthetic progestogen is marketed as Crester. Norgestomet is a very potent synthetic progestin with a potency factor of 100 to 200 times that of the endogenous progesterone. Crester treatment requires no heat detection and fixed time AI can be carried out.

Crester is a synchronisation method in cyclic animal based on short term progestrone treatment in combination with an anti luteotropic factor. The implant mimics CL without physically interfering with reproductive tract. The injection endures that natural CL has regressed at the time of implant removal.

In true anoestrus, the Norgestomet will prime the reproductive system and will also inhibit secretion of pituitary gonadotrophins. With formation of artificial CL by norgestomet implant, it is possible to regress available ovarian CL by oestradiol valerate and immediate imposing of block on pituitary by norgestomet through crester injection. PMSG given at the time of implant removal will stimulate follicular growth to induce fertile oestrus.
PRID & CIDR are intravaginal devices releasing natural progesterone over a period of time. Mode of action is similar to Crestar but the luteolytic effect/ component is provided as an Oestradiol benzoate capsule attached to PRID or injection of either Oestradiol or PG in CIDR. With PRID & CIDR treatments heat detection is always necessary for appropriate time of AI.

Never forget that no remedy can create fertility in animals. It is possible to boost and exercise control fertility in productive dairy animal.
RECORDING OF REPRODUCTIVE ABNORMALITIES IN DOMESTIC ANIMALS
A Technical Mandate For Veterinarians

Markandeya, N. M.¹, Moregaonkar S.D.², Bhikane, A.U.³ and Kulkarni A. M.⁴
Teaching Veterinary Clinical Complex
Veterinary College (MAFSU), Udgir - 413 517 (MS)

Reproductive abnormalities are evident in Indian domestic animals at a large extent. Collective efforts are necessary for proper diagnosis and generation of substantial data for analysis of abnormalities, which in turn will help to reduce the incidence of reproductive abnormalities. It is mandatory to encourage field veterinarians and practitioners for recording, reporting and analysis of reproductive abnormalities.

Dairy owners expect animals with sound reproductive health for better productive and reproductive potential under economic dairy business. For the purpose, standard breeding policy, breeding records should be available and culling of known defective animals with genetic abnormalities should be followed very strictly and regularly. This helps to improve the breeding standard and production potential of the domestic livestock.

Lethal and genetic abnormalities cause embryonic death or development of monstrosities during gestation. Such defective foetuses are usually aborted and it is the nature’s way of eliminating abnormalities at low biological cost (Roberts, 1971). A review on congenital anomalies and their etiology is detailed by Morrow (1980).

Incidence of developmental abnormalities is always high in animals on field level. However, the perusal of literature reveals meager reports published regarding such abnormalities. It is necessary

1. Associate Professor Gynaecology and corresponding author,
2. Associate Professor Pathology,
3. Sectional Head, Dept. of Clinical Medicine, Veterinary College, Udgir-413 517(MS)
4. Livestock Development officer, Disease Investigation Section, Pune - 7
to study incidence, type and severity of abnormalities in all species of domestic animals under economic animal husbandry practices. A modern collective noun for diseases of the concepts is embryopathy (Arthur et al. 1989).

As compared to the worldwide livestock population, India possesses largest livestock population. Livestock is being continuously exposed to many harmful and defective factors at field level due to less awareness regarding environmental threats. Low incidence of environmentally induced reproductive abnormalities is seen in western countries. In developing countries like India, environmental awareness is less in the society and hence there is wide scope for recording causes of reproductive abnormalities of environmental type.

Regular reporting of abnormalities helps in recording species wise; region wise, breed wise incidences and accordingly breeding policy can be revised. In absence of proper records and reports, it becomes difficult to eliminate recessive, lethal, sub-lethal genes and hereditary defects.

On birth the defective foetus, possibly either it dies immediately after birth or it is neglected and spared for culling by the owner. If there is any noticeable abnormality in any body system, newborn calf is presented for clinical examination and surgical correction. In case of defect of any body system, animal fails to reproduce and hence abnormalities primarily affecting other body systems are as important as that of abnormalities of reproductive system.

Sex of the newborn calf is recorded by observing external genitalia and the animal is considered as normal in terms of reproductive system. Case of reproductive abnormality remains unnoticed till pubertal age. Defects of reproductive system and particularly that of the internal genital organs remains unnoticed and the new born calf is reared and cared for 18 to 24 months or till detection of its abnormality at the first gynaeco-clinical examination.

Since defects of internal genital organs are not detectable till pubertal age, it is mandatory to investigate the reproductive system thoroughly and confirm its normalcy in terms of structures and probability of functioning at the pubertal age in each animal. There
is no practice to present the animals for reproductive check up at the pubertal age for detection of reproductive abnormalities even under standard managerial practices.

**Present scenario**

Few academicians and scientists working in research institutes and laboratories regularly record and report reproductive abnormalities and defects of domestic animals. Interest and the attitude are most important for such reporting even if the defect is minor one. Prompt reporting helps to communicate the defective cases through the scientific literature.

Veterinary clinicians come across innumerable types of defective animals and cases during field visits, clinical camps or work campaigns. Generally monstrosities are reported but other reproductive defects remain un-attempted and non-recorded. Amongst the reported papers slaughterhouse material examination and reporting of incidence is common. Balagopalan *et al.* (1996) reported ninety cases of congenital anomalies in calves and kids. Markandeya (1997) reported a review on rare cases of reproductive abnormalities consisting of fifty varied cases.

Individual case recording is usually seen in all Indian scientific publications. However, review, analysis and recommendations on scientific abnormalities are lacking at present. The possible reasons for non reporting as well as recording of reproductive abnormalities under field conditions are lack of adequate knowledge, unavailability of ready references, scarce diagnostic facilities and even the less interest of field practitioners.

Apathy and unawareness is common amongst field veterinarians to avail facilities from national research institutes for confirmation of cause of reproductive abnormality. Lack of approach, complexity of mind, inadequate information and description of abnormality, inappropriate genetic analysis of the case and failure to integrate underline embryological, pathological and genetic process etc. are the additional problems in assessment of defects.
Nature of defects:

An anomaly is the developmental defect or malformation affecting an organ or part of the body. Such malformations are called congenital if those are present in animals at birth. Congenital defects are abnormalities of body parts in the form of structure, function or both. Monstrosity means extensive anomalies in number of body systems of an individual.

Congenital defects are caused either by hereditary and environmental factors or by the interactions of these factors. Metabolic and endocrine imbalances during pregnancy predispose congenital malformations in foetus. The frequency of individual defects will vary among breeds, geographic locations and seasons. However, many congenital defects have no clearly established cause. Congenital defective calves pose a diagnostic challenge to vets and many defects go unnoticed generation after generation.

The abnormal developments and malformations of the antenatal individuals is dealt with the division of embryology and pathology, which is called as teratology (Robers, 1971). Teratogens cause chromosomal mutations and congenital anomalies during pregnancy, which turns into monstrosity. A modern collective noun for diseases of the concepts is embryopathy (Arthur et al. 1989).

There is increasing interest in knowledge of morphology and composition of cell, chromosomes and genes in relation to biological process. Domestic animal carries many harmful autosomal recessive genes whose presence in the heterozygous state cannot be recognized. Cytogenetics is the science, which deals with chromosomal abnormalities.

Chromosomal aberration may be numerical or morphological. In absence of sex chromosomes aplasia or dysgenesis of gonads takes place. It is obvious that damage to particular genes is possible without visible effect on morphology of the parent chromosome and that as a consequence the visible aberrations of chromosomes represents only a fraction of the defect that may occur (Arthur, et al. 1989).
Classification of reproductive abnormalities:

At present there is no standard procedure to classify the reproductive abnormalities. Lack of standardized system for classification of birth defects makes comparisons in the literature difficult. The deficiency interferes with exchange among the various disciplines and also with accumulating readily retrievable data on congenital birth defects. However, for easy reference and to facilitate interdisciplinary comparisons, it is recommended that congenital defects be classified by the body system primarily affected (Morrow, 1986).

Reproductive abnormalities are usually classified as genetic, congenital and acquired causes on the basis of their origin. Abnormalities can be structural or functional and even obstructive or non-obstructive. However, these abnormalities can also be classified on the basis of causative factors.

Genetic or inherited causes:

These are the causes transmitted to the offspring through the germ plasm (genes). Genetic or hereditary defects are pathologic or patho-physiological resulting by mutant genes or chromosomal aberrations. Genetic causes may also be termed as intrinsic causes; predisposing causes, internal or abnormal constitutional factors and these may be lethal or sub-lethal.

Lethal are genetic factors that cause death of the individual during prenatal life or shortly after birth. These are inherited and invariably cause death of the offspring (animal) either in utero or soon after birth. Majority of the lethal genes is recessive and may remain hidden for many generations. The term sub-lethal represents less drastic physiological or anatomical incompatibilities than the lethal. These are inherited and interfere with the function of the body but do not cause death. Inherited errors are the defects that are inherited errors in structure and function. Thousands of malformations have been listed out in the literature under lethal category. However the criteria to decide lethal or semi-lethal genetic involvement for the case depends solely upon viability of the individual. Genetic diseases run in families in typical inter-generational and intra-generational
patterns. Various statistical methods are used to analyze such data and breeding trials may be necessary to confirm inheritance pattern.

**Non-genetic or Environmental causes:**

Another set of causes consists of non-genetic or non-inherited defects, which are not transmitted to progeny via germ plasm, but the defects develop as a developmental defect in organ or system. Reproductive abnormalities formed during gestational development of embryo or foetus is basically due to various factors. Viz. failure of fusion of structures, failure of local tissue growth, incomplete growth, arrested division or reduced size, displacement of structures, failure of fusion of sexual characters, absence of lumen, fusion of organs, persistent of primitive structures, excessive divisions, excessive development or duplication, failure to form structure, complete absence of development or miscellaneous factors.

Susceptibility of the conceptus to the deleterious influence decreases with the age of embryo. During pre-attachment and embryonic period, genetic mutations are common. Some critical periods are considered as susceptible periods for teratogenesis during term. Period of ovum extending from conception to two weeks of gestation is the period of high lethality and but the same is non-sensitive to teratogens. Period of embryo extending from three to eight weeks of gestation is the period of greatest sensitivity to teratogens and each organ has a specific period of peak sensitivity. Period of foetus extending from nine to thirty eight weeks is the period of constant decrease in sensitivity and is the period of functional maturation.

Environmental causes include many teratogenic factors as nutritional deficiencies, endocrine disorders, physical factors, radiation, drugs, chemicals, infections, aging of gametes and genetic disorders. Additionally, irradiation, hyperthermia, pressure during rectal examination, magnesia deficiency, Vit. A deficiency, fetal hypoxia, aging of ova, iodine deficiency may have teratogenic effect. Recent work in Germany has revealed that rectal palpation and pressure on amnion between days 33 to 40 of gestation may cause atresia coli and occasionally atresia jejuni (Morrow, 1986).
It is difficult to identify the exact environmental factor responsible for a particular defect. But often these factors follow seasonal patterns and known stressful conditions and may be linked to material diseases. These defects do not follow familial pattern, as do genetic causes. They do occur in any genotype during the appropriate critical period.

Genetic – Environmental interactions: Even though little is understood, the complex interaction between genetic and environmental factors is slowly gaining prominence as knowledge of congenital defect increases. Many times interaction between the aforesaid factors and group of factors in combined effect leads to reproductive abnormalities.

Malformations in the genital organs are of fundamental importance and they may cause infertility or sterility. Both anatomical and functional forms of infertility can be of hereditary origin. Inheritance, endocrine dysfunction and modified manifestations can cause malformations of genitalia. Some genes affect both male and female individuals but others are limited to any one sex. Females are commonly affected and severity of abnormality is also extensive.

Case recording

This is the first and the foremost vital part in reducing the incidence of reproductive abnormalities. It is necessary that all learned field veterinarians should undertake the task of recording and reporting any reproductive abnormality irrespective of its small or large consequence and severity. It is important to attend cases of reproductive abnormalities, record detail history of the case, clinical observations and then each case should be reported in a standard protocol or format to the breeding center and scientific literature.

In most of the veterinary clinics and polyclinics the standard format for recording clinical cases is generally available and is used regularly. However, there is no standard method or format for guidance of field officers for recording various reproductive abnormalities in farm animals. Hence all salient observations need to be recorded. Following points may serve as help guidelines to record the abnormalities.
1. General information: Place, geographic area, breed of the tract, method of breeding, feeding practices, breeding policy, soil type, seasons and characteristics features of environment should be recorded. Similar cases recorded earlier in the area/ herd should be recorded.

2. Breeding history: It is necessary to record breeding history of parents of the affected animal along with blood relatives and co-twins (full-sibs and half-sibs). Age, breeding performance and other details should be recorded regarding all related animals. It is necessary to collect history of dam regarding pregnancy number, season, feeding practices, management, vaccination record, exposure to suspected teratogens, diseases, stage of termination.

   History of sire including the breed and animal number with age and semen collection number should be recorded. It is important to screen prospective AI bulls for hidden recessive genes and hence test mating is necessary. Record of earlier andrological investigations of the bull is also necessary.

3. Affected individual: Note the stage at which the abnormality was recorded (embryonic mortality / abortion / premature birth / still birth / neo-natal birth / pubertal age / breeding life). It is common practice to record anomalies of aborted foetuses or the foetuses expelled before and near the term. In case of affected individual sex, birth weight, body measurements, systems involved, live or dead at the time of birth and dimensions of the affected part should be recorded. Detail procedure of standard necropsy examination should be adapted.

   Photographic and video-graphic documentation helps in clarifying the detail information of the case. It is necessary to record system wise description of body systems, behavioural aspects and secondary sexual characters of live mature defective animal. Note physical appearance of the defect. Observations on external genitalia and rudimentary parts are important. Gynaeco clinical examination of each defective animal is always necessary.
Case diagnosis

1) **History:** Diagnosis of reproductive abnormality depends on observations, laboratory reports and consultation with experts. On attending the case, only tentative diagnosis should be made. As majority of reproductive abnormalities is possibly due to lethal and sub-lethal genes, investigation of affected animals along with their parents, blood relatives is highly essential.

2) **Necropsy findings:** If the individual is dead, standard necropsy procedure should be adopted and all salient points must be recorded for various bodily organ.

3) **Clinical examination:** It is necessary in case of live defective animals. Clinical parameters should be noted first. By rectal palpation, it is possible to distinguish functional and malformed conditions. It is possible to record X-ray observations in some cases.

4) **Laboratory investigation:** Culture sensitivity and pathological investigations of fluid are important. Tissue specimens should be sent for histo-pathological investigations. Blood samples can be collected for hormonal studies. Blood samples can be sent for chromosome estimations, chromosome number and pattern estimation, karyotyping, DNA probes etc.

5) **Genetic studies:** Modern diagnostic facilities such as, DNA finger printing, karyotyping, PCR testing etc. are now readily available at various National Research Institutes in India. These institutes extend diagnostic support and technical advice of experienced human resource for pin pointing the cause of reproductive abnormalities.

6) **Ultra sound scan:** Ultra sonography is the modern method of detecting defective foetuses during pregnancy. With modern colour Doppler facilities, it is possible to detect congenital abnormalities before term. Medical science is advanced and awareness is the important factor in reducing reproductive abnormalities. However, in animals the period has to be come for availability of such modern facilities at field level. At present it is possible to recommend ultrasonographic foetal examination of at least pregnant and blood relatives of the animal in which the any reproductive abnormalities has been recorded.
7) Test mating: Doubtful parents should be analysed through test mating. Breeding bulls should be used for artificial insemination purpose only after progeny testing. Mature dams with history of defective progeny should be used for breeding only after thorough investigations. On completion of etio-pathological diagnosis with the help of investigation in laboratories, diagnosis should be confirmed. On comparing the report with similar conditions, differential diagnosis can be recorded. It is possible to collect information on the subject and also to discuss with scientists all over the world regarding any reproductive abnormalities through electronic notice board of Internet facility and it is also possible to consult scientists. It is necessary to discuss the recorded and confirmed diagnosis of reproductive abnormalities with gynaecologist, pathologist, geneticists and surgeons for final reporting.

Case reporting

All recorded cases of reproductive abnormalities should be reported to all the veterinarians of the region, milk union, universities, breeders associations, government agency and to the scientific report publishing journals. All these agencies should have facility to store the reported data. Additionally, these institutes should work like resource agencies for field practitioners and also publish analysed available data for information of all professionals.

Recommendations:

1. Record each case of reproductive abnormalities and report the same to the AI center, government, breed associations and scientific literature.

2. Avoid breeding of all defective animals along with their parents and relatives.

3. Rectal palpation of early pregnant animals (1 to 1½ months) must be gentle to avoid embryonic losses and formation of defects.

4. Disposal of defective cases should be avoided without thorough laboratory investigations. Preserve defective aborted foetuses and send live defective animals to the research institutes for genetic studies.
5. Seek help of animal scientists or laboratories for diagnosis of reproductive defect and its cause. Diagnostic tests should be carried out in advanced research laboratories with sophisticated modern technologies.

6. Photographic and video documentation of each defective case is essential.

7. Thorough gynaeco-clinical examination of heifer and complete andrological investigation of bull is necessary on attainment of puberty before putting them to breeding.

8. Acquired reproductive abnormalities should also be recorded and appropriate line of treatment adopted should be reported.

9. Extension work is necessary to increase awareness regarding defective case recording, to prevent propagation of defective causes in animals and to extend consequences of breeding in defective animals amongst animal owners.

10. Myths and mis-concepts are to be ruled out from traditional animal husbandry practices. Propagate that defective animals are not the "miracles of the nature".

11. It is mandatory to keep open eye on exploitation of defective animals and cruelty being adopted on defective animals.

   It is essential to have breed association, defined breeding policy, database of the breed and record of similar cases to reduce the incidence of reproductive abnormalities. Certification should be made compulsory at the time of marketing to indicate that animal is not having any defect. It is always necessary to seek help of advanced technologies in genetic engineering to rule out possibility of hereditary nature of defect. It is possible to adopt standard managerial practices for reducing environmentally induced defects.

References:


2. Balagopalan, T.P., Devanand, C.B., Rajankutty, K., Sarada


MODEL FORMAT FOR RECORDING REPRODUCTIVE ABNORMALITY

GENERAL INFORMATION:
Place ____________________ District ____________________ State ____________________
Geographic location ____________________
Soil type ____________________ Soil mineral status ____________________
Seasonal pattern ____________________
Environment: Climate _____________, Temp. _____________, Humidity _____________
Rainfall ____________________, Wind velocity ____________________
Species _____________, Breed _____________, Strain _____________
Breeding method practiced ____________________
Feeding practices ____________________
Managemental practices ____________________
Vaccination record ____________________
Common diseases ____________________, Known teratogens ____________________
H/o Similar cases / Earlier abnormalities recorded ____________________

DAM: Age _____________ Breed _____________ Parents: Dam _____________
Sire _____________
No. of calving completed ____________________
Earlier progeny: Male ____________________ Female ____________________
Co-twin: Number ____________________ Sex ____________________
Viability after birth ____________________, Normalcy ____________________
Defective, if any ____________________, Type of defect ____________________
Method of Breeding ____________________, Dates of Breeding ____________________
Exposure during pregnancy (drugs / vaccines / poisons) ____________________
History of any other defect recorded earlier in blood relatives ____________________

SIRE: Age _____________ Breed _____________ Parents: Dam _____________
Sire _____________
Commencement of breeding _____________ Collection / ejaculate number _____________
Andrological investigations _____________ Semen quality _____________
History of any other defect recorded earlier in blood relatives ____________________
AFFECTED INDIVIDUAL:

1) Gross details:

Photographs: Front view / Rear view / Cross sectional / Lateral view / Close snap / Gross picture / Dorsal view

Typical snap / post mortem snap

Breed _______ Sex _______ Birth weight _______ Live / Dead _______

Viability after birth _______ Body measurement _______

Description of the defect _______

Measurements of the defect _______

System/systems involved _______ Organ / organs involved _______

Dead individual: Necropsy details _______

Live individual: Clinical details _______

Radio graphic findings _______

Ultra sound scan: _______

2) Reproductive details:

Behavioural aspects _______ Secondary sexual characters _______

Breeding history: Age of puberty _______ Age at first calving _______

Number of calving _______ Date of last breeding _______

Reproductive system: Normalcy / Abnormally _______

External genitelia _______

Per-rectal findings _______

3) Lab investigative details:

Microbiological investigations (culture sensitivity) _______

Blood investigation: a) Haemogram _______

b) Hormonal levels _______

c) Genetic studies: _______

Karyotyping: No. of Chromosomes _______ Structure of chromosomes _______

4) Diagnosis:

1) Tentative diagnosis _______

2) Etio-pathological diagnosis _______

Final diagnosis _______

5) Treatment:

Medical / therapeutical: _______

Corrective / surgical: _______

6) Recommendations _______

Govt. Photozinco Press, Pune - 411 001.