



Kenya Climate Smart
Agriculture Project

HOW TO CONTROL INFERTILITY IN DAIRY CATTLE FOR IMPROVED PRODUCTIVITY



Reducing Infertility in small holder dairy cattle for improved productivity

What is infertility?

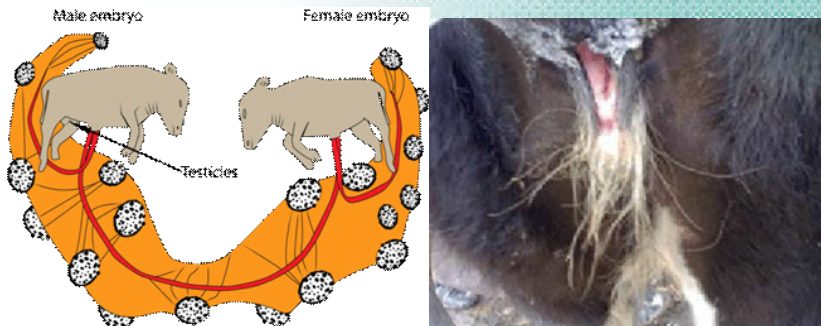
Infertility is a condition in which an animal is not able to reproduce normally due to some causes as will be discussed. In certain cases, the cow may be healthy but exhibit temporary infertility due to poor nutrition which interfere with reproductive functions

In other cases, cows due to abnormal hormonal levels and abnormalities of the ovary become infertile. Other forms of infertility are silent heat and lack of conception.

Types infertility farmers are likely to encounter on the dairy farms

Anatomical infertility

This is where the animal has a physical defect within the reproductive organs which compromises reproduction. This form of infertility is rare and is mostly untreatable; farmers are advised to cull affected cows. Such animals are identified when carefully examined at puberty. An example of such is freemartin females. These are females born as twin calves but one twin is a bull. The hormones from the bull calf hinder the proper development of the female reproductive organs of the female twin thus rendering the cow infertile.



Development of a freemartin and signs of a freemartin heifer (Long tuft of Hair) Source (Bhattacharyya, 2015)

Freemartins have:

- Abnormally long tuft of hair on the vulva.
- An unusually large-sized clitoris.
- Masculine/overly good body condition (always appears like a male or a beef cow).
- Vagina ending in a dead end due to cervical abnormality



Infectious infertility

This type of infertility is caused by diseases which affect the reproductive system of cows.

Most of these conditions go unnoticed due to lack of specific or pronounced signs of disease. Infectious infertility manifests itself as unexplained abortions, placenta fails to drop abortions or calving.

Symptoms of infectious infertility

Animals with reproductive disease(s) may show one or more of the following symptoms:

- Abortions
- Do not conceive despite repeated inseminations.
- Retained placenta/afterbirth.
- Pus discharge from the vulva

- Birth of weak calves or stillbirths.

NB: In case infectious infertility is suspected, farmers are advised to seek the help of qualified veterinary practitioners. Similarly, due to the potential hazards associated with handling discharges or placentas of cows which have aborted, farmers are advised to use protective gear while handling such materials and to ensure they safely dispose them off properly

Physiological infertility

This is infertility caused by the failure of the animal to produce sufficient levels of hormones necessary for reproduction. The animal will appear normal but will not be able to express normal heat.

Signs of physiological infertility

- *Silent heat* - cows on heat do not show any visible signs.
- *Anoestrus* - cows are not coming to heat (despite being within the reproductive age, the ovaries stop temporarily producing eggs).
- *Repeated inseminations* - cows do not conceive on insemination and they return to heat after 21 – 24 days.
- *Ovulatory defects* - Eggs develop normally in the ovaries but ovulation is interrupted usually by instability in hormonal levels in the body.
- Other defects include persistent Corpus Luteum (CL) and Cystic Ovaries or Luteal Deficiency.

Nutritional infertility

This is the most common cause of infertility. Poor nutrition leads to low energy levels that cannot sufficiently support reproductive processes in the body.

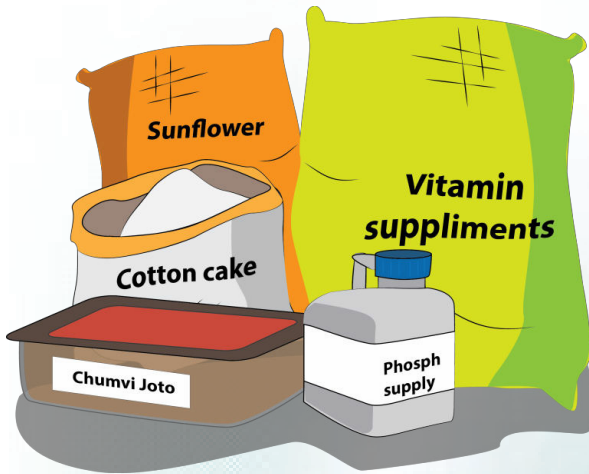


Dairy animals on overgrazed pasture in an extensive production system



A malnourished cow in a small holder farm. Such animals may have nutritional and physiological infertility

Supplementation can help solve infertility caused by poor nutrition. Vitamins A and D are the most important vitamins in reproduction as well as phosphorus. High energy and protein diets are also important.



An illustration of supplements required by the dairy animal

Use of hormones for management of infertility in cattle

Solving infertility in cattle is vital to achieve milk production as well as a calf per cow per year. Achieving this when there is physiological infertility may require medical intervention. Hormones may be administered to bring cows to the same stage of cyclicity, commonly referred to as synchronization. The use of hormones, however, is a sensitive issue requiring professional know how and strict adherence to protocols to achieve success.

Identifying animals that requires hormones

A group of fertile cows may require hormone injection to synchronize them, thus enhancing farm management. In infertile cows, the veterinarian will commonly use the hormones when:

- The farmer is not able to detect heat and there is increasing inter-calving intervals among the affected animals.
- Heifers have reached puberty and attained 2/3 of the mature weight, without coming on heat.

- Cows come on heat frequently with very short and irregular estrus periods (e.g. in cystic ovarian disease)
- Cows have repeat breeding syndrome.
- Cows are diagnosed with uterine infections (e.g. pyometra).

Hormones to use

The veterinarian relies on the history of the cow and the gynecological examination to determine which hormones to use. The history gives a clue of the type of infertility the cow is having. The gynecological exam which involves meticulous and skillful palpation of the ovaries is very crucial because it gives an indication of the stage of the cycle the cow is in and therefore determines the hormone to use.

How to use reproductive hormones

As stated, under signs of physiological infertility in section 2.3.1 above, the veterinarian should have good skills in ovarian palpation and must examine meticulously both ovaries. The veterinarian should also be accustomed with the hormone protocols, route and dose of administration.

Protocol one

Non-pregnant cows that are found to have a persistent corpus luteum should be given the hormone $\text{PGF}_{2\alpha}$. The animals will come on heat 48 hours after treatment and should then be served using the am pm rule. About 40% of the cows will be non-responsive and will require a second $\text{PGF}_{2\alpha}$ injection 11-14 days later. These will come on heat 48 hours after the second injection, and they should be served as before.

Protocol two

The other percentages of cows have either follicles or their ovaries have no structures, and these are termed as acyclic. These cows respond to a GnRH injection and ovulate within 7 days. Such cows should be observed for heat and served.

Estrus synchronization

If the veterinarian determines the farmer is not able to detect heat, an *ovisynch* protocol may be used in which both PGF2 α and GnRH are used interchangeably, and timed insemination done 10 days after the first GnRH injection without observing heat signs. This, however, requires serial visits to the farm by the veterinarian.

A protocol in which the PRID (Progesterone release intravaginal device) allows controlled internal drug release (CIDR) of progesterone can be used on cows at any stage of the cycle. This device is inserted for 7 days within the soft birth canal of the cow. On the 6th day PGF2 α is administered on the neck muscles. The device is removed on day 7 and heat is observed within 96 hours thereafter. The cows are inseminated 12 hours after first detection of estrus.

Reproductive hormones should only be administered by a qualified animal health service provider to avoid side effects such as abortions. Approved hormones are safe to the animal health service provider administering them and the animals they are administered on.



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