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Major Reproductive Health Disorders in Dairy Cows

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Abstract

This review mainly focuses on major reproductive health problems in dairy cows. Reproductive disorders occur frequently in dairy and beef cows and significantly affect the efficiency in a dairy cow. Generally, the efficiency of reproduction is influenced by the interactive effect of environment, management, and genetic factors. Furthermore, diseases commonly affect dairy cow productivity by decreasing reproductive efficiency, shortening the expected length of productive life, and lowering milk production. This review identified major reproductive health problems of dairy cows. Anoestrus, repeated breeder, dystocia, abortion, retained fetal membranes, uterine prolapse, vaginal prolapse, and uterine diseases are the common problems hindering the production and productivity of dairy cattle. For these reasons, ensuring proper management can be recommended for animal owners, dairy managers rather than focusing on the prevention and control of risk factors. Improved post-partum management including proper feeding, cleanliness, good hygiene, accurate heat detection, and AI service in proper time should be improved to minimize the occurrence of reproductive problems.

keywords: Dairy Cows; Reproductive Disorders, Reproductive Efficiency

Introduction

Reproduction is a complex process in which individuals produce their offspring to perpetuate life. It is a crucial factor in determining the efficiency of cattle production (Ibrahim and Seid, 2017). It is an important consideration in the economics of livestock production, particularly in cattle. This goal achieved only by improving the reproductive efficiency of the dairy cows. Successful reproduction encompasses the ability to mate, the capacity to conceive and nourish the embryo, deliver the viable young ones at the end of a normal gestation period, have functional ovaries, display estrous behavior accurately, resume estrous cyclist and restore uterine function (Dabale et al., 2020). Reproductive efficiency is a very important component of a successful dairy operation and acts as a critical component of a profitable dairy farm. The performances of animals depend on intrinsic factors (genetic merit) and extrinsic factors (nutrition, management, health, and environment). Maximal reproductive efficiency requires management of the intervals between calving. These includes number of services per-conception (NSC), calving interval (CI) and days open (DO) as important criteria for profitable dairy farming (Borakhatariya et al., 2018) [1-3].

In dairy cattle production, one cow must give one calf per year. However, this objective is not always attained due to the presence of different factors interfering normal reproductive process and the function of dairy cows (Weldeyohanes and Fesseha, 2020). The reproductive efficiency of dairy cows is influenced by different factors including managemental systems (such as methods of husbandry, breeding strategy, estrus detection, semen handling and transition cow management), animal factors (genetic, age, body condition), nutrition (availability of green fodder round the year) and environmental conditions (geographical location, season of calving and suckling status) under which cattle are maintained could greatly affect production and productivity (Abuna et al., 2018). Reproductive problems are among different ranges of problems in dairy cows, can affect reproductive conditions like the manifestation of oestrus, the production, transport and fertilization of ova and the transport, implantation, and survival of the conceptus (Mitiku et al., 2018) [4-6].

Infertility is very common in dairy herds in which calving interval of 12 to 13 months is generally considered to be economically optimal, but often it's difficult to achieve due to infertility of which reproductive disorders like dystocia, retained placenta, prolapses, repeated breeder, anoestrus, and uterine diseases as common constraints hindering production and productivity in dairy cows. Economic losses due to these reproductive health disorders leads to slower uterine involution, reduced reproductive rate, prolonged inter-conception period and calving interval, high cost of medication, drop in milk production, reduced calf-crop, and early depreciation of potentially useful cows (Lobago et al., 2006) [7].

Although, the major reproductive problems are greatly responsible for high economic loss in the dairy industry, there is a scarcity of reliable information regarding the reproductive performances of dairy cows in subsistence dairy farms in the tropics, Therefore, the aim of this study was designed to review major reproductive health disorders in dairy cattle.

Major Reproductive Health Disorders in Dairy Cattle

Anoestrus

Anoestrus is a functional loss of the reproductive cycle which is characterized by absence of overt signs of estrus manifested either due to lack of expression of estrus or failure of its detection. If estrus has not been exhibited in a dairy cow by 60 days postpartum the condition is defined as Post-Partum Anoestrus (PPA), whether she is cycling or not. Anoestrus is observed in post-pubertal heifers, during pregnancy, lactation, and in early postpartum period in adult animals (Kumar et al., 2014). It is a multi-causative factor associated problem, but its occurrence signals the inadequate nutrition, environmental stress, uterine pathology and improper managemental practices (Yavas and Walton, 2000) [8].

Anoestrus due to physiological factors

Prepubertal anoestrus: The waves of the follicle in prepubertal animals are like that of adult, but follicles grow in response to FSH secretion only up to the stage where they have a theca interna and then regress. Such kinds of heifers remain in anoestrus before the puberty onset. The consequence of pre-pubertal anoestrus includes low Luteinizing hormone pulse frequency that results in insufficient growth of follicles; the inhibitory effect of opioids on Luteinizing hormone secretion and high threshold for positive feedback effect of oestradiol on LH surge (Noakes et al., 2009) [9].

Gestational anoestrus: Increasing level of progesterone during pregnancy exerts negative feedback effect on GnRH secretion from the hypothalamus and reduces LH pulse frequency resulting in anoestrus. However, sometimes cattle and buffaloes show estrus during early pregnancy (known as gestational estrus) which is seen most often during the first four months of pregnancy. According to few studies in India, the incidence of gestational estrus has been recorded as 3.33 to 20.3% in cattle (Kaikini and Fasihuddin, 1984). Occasionally, cow exhibits gestational heat only once during pregnancy, however, few animals show twice or thrice in the same gestation [10,11].

Postpartum anoestrus: After parturition, all the females undergo anoestrus for a variable but short period of time, known as postpartum anoestrus. The period of postpartum anoestrus is usually shorter in cows than in the Buffalo under similar management conditions, probably due to low LH secretion during the early postpartum period (Perera, 2011). Most dairy cows resume the ovulatory estrus cycle within 15–45 days postpartum (Forde et al., 2011). The physiological postpartum anoestrus cannot be avoided and is useful to allow uterine involution prior to first postpartum anoestrus [12,13].

Anoestrus due to Congenital factors

Freemartins: It's an abnormality intersexual form among cattle breeds in herds. A freemartin is a male or female chimera that results from the fusion of the chorioallantois circulation of twin male and female fetuses, with subsequent interchange of leukocytes and masculinization of the female twin. Normally, a freemartin female has extreme ovarian hypoplasia and nearly complete absence of the tubal genitalia but the external genitalia seems to be normal or slightly different (Esteves et al., 2012). In bovine, a female calf born twin to a male is considered to be sterile and must be detected and identified earlier in order to cull it. Nonetheless, some freemartins born singleton may identify as normal calves because its co-twin has been dead in the uterus (Esteves et al., 2012) [14-16].

Ovarian hypoplasia: It's an occasional condition characterized by incomplete ovarian development wherein the affected ovary or part of the ovary completely lacks follicles (Akkoyunlu et al., 2014). Based on their morphology, ovarian hypoplasia categorized into three types these are total, partial and transitional. A number of aetiologies have been reported for ovarian hypoplasia include autosomal dominant genes, autosomal recessive genes resulting in different types of female gonadal dysgenesis and X chromosomal abnormalities (Simpson, 1999) [17,18].

Anoestrus due to management causes

Silent or non-detected estrus: In this condition, a cow show estrus but no one can follow the cow. After the puberty onset, cyclic ovarian activity should be maintained continuously through the cow's life except during pregnancy and for a short period in the puerperium. The herdsman knows estrus signs only when it is occurring at approximately 21 days intervals. If a management system is poor, it is possible that there are signs but those they one not being observed (Arthur et al., 1982). According to Lopez et al., (2004), The failure of owner to detect a cow in estrus and characterization estrus signs by visual observation with the absence of accurate reproductive information doesn't properly provided valid data about duration d intensity of estrus [19-21].
Sub-estrus: There may be normal cyclic ovarian activity for many cows, but the cow is not exhibiting the normal behavioural signs; this is described as sub-estrus or silent heat. The first and second batches of ovulations post-partum are frequently not preceded by behavioural signs of estrus and are thus truly 'silent heat'. Following the second estrus, it is unlikely, that may result in true silent heats occur. When ovulation occurs in the absence of observed estrus it is more likely to be the result of a failure of observation due to the short duration of estrus behaviour than to poor detection.

Persistent corpus luteum: Any factors that influence the production or release of endogenous luteolytic results in persistent corpus luteum. Most of the time, cows diagnosed as false positive due to is the condition which most frequently results in the persistence of corpus luteum, but in the presence of uterine infection and inflammation of the tissues there is interference with the production or the release of luteolysin. Evidence from some authors show there is little firm evidence that the persistence of the corpus luteum can occur in the absence of uterine lesions (Niswender et al., 2000) [22].

Repeated breeder

Cow(s) called as repeat breeder when it has unsuccessful to conceive even after three or more number of services, has regular estrus cycle length, no aberration in the vaginal discharge, no palpable abnormality in the reproductive tract, has calved at least once before and less than ten years of age (Wodaje and Mekuria, 2016). Numerous investigations have recorded

that many components result in repeat breeding syndrome-like sub-fertile bulls, endocrine problems, malnutrition, reproductive tract infections, poor management, any anatomical dysfunctioning of genital tract and host defense mean against semen (Asaduzzaman et al., 2016). There are manifold risk factors for repeat breeding in dairy cattle in which fertilization failure and early embryonic area of two major factors [23,24].

Fertilization failure: About 40 percent of the repeat breeder cows are due to fertilization failure. Fertilization failure triggered due to Abnormalities in Ovulation, Oviduct impairment, Abnormal environment of Oviducts and Uterus, Endocrine Dysfunction, Genetic or Acquired Defects of Ova, Genetic or Congenital Anomalies of the Genital Tracts, Gonad less Condition and Hypoplasia of the Ovaries, Genetic Defect, and Aging of spermatozoa, improper handling of semen and AI (Wodaje and Mekuria, 2016) [25].

Early Embryonic Death: The death of an organism within the first 15 to 21 days of artificial insemination or natural mating is known as early embryonic death. The etiology of early fetal mortality can be divided into the infectious agents and non-infectious agents. Around 70% of EED occurs due to non-infectious causes (Vanroose et al., 2000). Most of the early embryonic death occurs between 8 and 19 days after breeding before the significant stage of maternal recognition of pregnancy. Embryonic death may be due to cytogenetic abnormalities of the early embryo, adverse uterine environment by hormonal imbalances, uterine infections, nutrition, environmental stress, and immunological factors. Non- infectious causes comprise chromosomal abnormality, hormonal imbalance, disturbance in mother fetus interactions and inbreeding, etc. Twenty percent (20%) of total early fetal loss occurs due to chromosomal abnormality in dairy cows (Shah, 2019) [26,27].

Infectious causes may be due to the explosion of some specific and nonspecific bacteria, viruses, and protozoa which result in unfavorable conditions of the uterus for implantation of the fetus. The occurrence of repeat breeding in dairy cows, worldwide, ranges from 3 to 10%. The possible causes of the repeat breeding mostly include pathological, endometritis, nutritional deficiency especially vitamin A The age of the dam, improper problems such as dystocia, retained fetal membranes and heat detection, and endocrine dysfunction (Ahmed, 2009) [28].

On an individual cow foundation, an optimal strategy for the treatment of repeat breeding often remains indefinable because of its multifactorial etiology, which involves cows, semen quality, and inseminator or insemination technique (Walsh et al.,2011) [29]. In females, some interconnected factors such as estrous behavior and certain endocrine aspects have been explored in modern high-yielding repeat breeder (RB) cows. Extended and/or silent estrus has been observed in up to 50% of RB cows (Cummins et al., 2012) [30,31].

Abortions

Abortion is defined as the premature exclusion of fetus between 42 days (the estimated time of attachment and approximately 260 days of gestation (the age of the fetus in which fetus can survive outside of the uterus). It is the most common problem of dairy cows which restricts the cow's ability to produce a calf yearly and can largely affect the profit of the dairy farm (Peter, 2000). Sarder et al., (2010) also define abortion as a condition in which the fetus is delivered live or dead before reaching the stage of viability where the delivered fetus is visible by naked eyes. The judgment of abortions is a major challenge to the herd owner and veterinarian. There is a rapid and spectacular increase of abortion in herds over a long period of time. For this reason, quick and absolute action is required when abortions do occur. Breeding dates, parity, production information and health events (e.g., disease or vaccination) can all aid to identify factors that may be related to abortions (Zwald et al., 2004) [32-34].

Hovingh, (2009) listed numerous causes of abortion: infectious agents (bacteria, viruses, protozoa, and fungi) and non-infectious (toxic agents, heat stress, and genetic abnormalities). Infectious agents are the most identified cause. Jamaluddin et al., (1996) examined 595 abortion submissions in California and found that infectious agents accounted for 37.1%; non-infectious agents, 5.5%; and undetermined causes, 57.3%. Among the 37.1% due to infectious agents, bacteria accounted for 18.0%; protozoa, 14.6%; viruses, 3.2%; and fungi, 1.3%. In Canada, Khodakaram-Tafti & Ikede, (2005) indicated that the three most common recognizable infectious agents were bacterial (24%), fungal (7%), and viral (6%) [35,36].

Dystocia

Dystocia can be defined as the incapability of the cow to expel neonates through the birth canal from the uterus. This condition occurs because of problems with the maternal or fetal (Mekonnen and Moges, 2016). As substantial time, effort, and expenses are spent in ensuring that a cow conceives, by artificial insemination (AI) or natural service, dystocia can have a huge economic impact on producers due to calf morbidity and mor-

tality (Abera, 2017), increased veterinary prices, decreased production, reduced fertility (Purohit et al., 2012), and in dangerous cases, injury to or death of the dam (Bicalho et al. 2008). Current research implies that dystocia can also have potential long-term effects on the calves born, reducing survival rate to adulthood and subsequent milk production in them (Atashi et al., 2012) [37-41].

Dystocia of maternal origin: Dystocia, which result from the mother due to maternal factors, are caused either by narrowing of the birth canal or by a deficiency of expulsive forces. The constricting forms of which the most important are pelvic inadequacies, incomplete dilation of the cervix, and uterine torsion (Noakes et al., 2001). Failure of cervical dilation and uterine torsion is the most common cause of dystocia of maternal origin. Failure of cervical dilation is associated with long-term progesterone supplementation during pregnancy (Mekonnen and Moges, 2016). Dystocia caused by the small size of the dam is occasionally seen if females are bred for the first time when they reach at least 65% of adult weight and height. Narrowing of the birth canal may be caused by space-occupying lesions or masses. Uterine inertia, arising from weak or absent uterine contractions, is sporadically seen in older animals or animals with prolonged pregnancy. Low calcium level may also be involved in secondary uterine inertia (Megahed, 2018) [42-44].

Dystocia of Fetal Origin: The fetal origins of dystocia in cattle can be classified into those caused by excessive fetal size relative to the maternal pelvis (Feto-pelvic disproportion) and those caused by abnormalities of the fetus (Fetal monsters, fetal diseases, and fetal maldisposition). Furthermore, the fetal origin of dystocia can be divided in general to the abnormal 3P's (P1presentation, P2-position, and P3= posture) (Kebede et al., 2017; Noakes et al., 2018). Presentation is the relation between the long axis of the fetus and the maternal birth canal; position indicates the surface of the maternal birth canal to which the fetal vertebral column is applied and posture refers to the disposition of the movable appendages of the fetus and involves flexion or extension of the fetal neck or limbs. Thus, in this review, fetal dystocia is reviewed according to fetal oversize and fetal abnormalities (Purohit et al., 2011). Dystocia caused by an oversized calf in a normal anterior longitudinal presentation is common in beef cattle. The normal delivery is made longitudinal, in the anterior presentation, dorsal sacral position; with bilateral foreleg extension (Cebra et al., 2014) [45-48].

Peri-stillbirth

Perinatal mortality may be defined as the death of the fetus or perinate before, during or within 48h of calving at full term (>260days); it includes both stillbirths and early neonatal mortality (Mee et al., 2014), While 'stillbirth' is commonly used as a synonym for perinatal mortality, particularly by farmers and their veterinary practitioners, it is better defined as the death of a fetus before or during calving at full term. An original portmanteau 'peri-stillbirth' (including both stillbirth and perinatal mortality) may avoid this terminological imprecision. These gestational and perinate age thresholds are random and vary both intra- and inter-nationally (Mee, 2020) [49,50].

According to some studies in Iran, the overall incidence of calf stillbirth in Holstein cows were reported to be 4.9% and varied among herds from 2.9 to 9.8% (Hossein-Zadeh et al., 2008). In recent years, the incidence of stillbirth parturition in dairy cows seems to have increased (Hossein-Zadeh et al., 2008). The USA reported an the increase from about 6 to 10.3% has occurred in the incidence of stillbirth during the past 20 years (Berglund et al., 2003). Meyer et al., (2001) stated the percentage of stillborn calves in primiparous cows increased from 9.5% in1985 to 13.2% in 1996 and increased from 5.0% to 6.6% from 1985 to 1996 for multiparous cows. Hansen et al. (2004) described the overall frequency of stillbirth in Danish Holsteins increased from 0.071 to 0.090 during 1985 to 2002 [51-53].

Retained fetal membrane

Several authors defined retained placenta as follows Drillich et al., (2006) defined retention of fetal membranes, it is the failure or delay in separation/expulsion of fetal membranes. Retention of fetal membranes from 6 to 24 hours post parturition is defined as retained placenta (Swiefy, 2003). Retention of placenta in the cow is defined as the condition in which the fetal membranes are not expelled within a period of 12 to 24 hours after expulsion of the fetus (Takagi et al., 2002). The failure of the placenta to be expelled within 12 hours post-calving is called retained placenta (Yusuf, 2013) [54-57].

It is one of the most common diseases after parturition. A fetal membrane is an essential organ for prenatal transfer of nutrients and oxygen from the dam to the fetus (Hanafi, 2011). It usually drops within short time postpartum (within 8 hrs of parturition), if it is retained up to 12 hrs then it is called delayed re-

moval and if retained for more than 24 hrs of parturition then it is called as 'Retention of placenta' (ROP). Such retention makes a number of problems by allowing microorganisms to grow inside the uterus instigating inflammation, fever, weight loss, decreased milk yield, longer calving intervals and may result in an open cow during the next year and if the infection is so bad the animal may actually die. It is one of the most common circumstance occurring in dairy cows following parturition (Patel and Parmar, 2016) [58].

Retention for greater than 12 hours after parturition is associated with increased postpartum disease, decreased milk production, reduced reproductive performance, and increased culling rates (Abdisa, 2018). Its incidence varies from 4.0-16.1% but can be much higher in problem herds. The achievable factors involved in the precipitation of the problem includes specific infections such as Brucella, Leptospira, Campylobacter, listeriosis, infectious bovine rhinotracheitis (IBR) and others, and nonspecific infections by a broad range of bacteria and viruses that occur during pregnancy or at calving, twine birth, nutritional deficiency and deficiency of selenium, vitamin E, vitamin A are connected with an increased prevalence of retained placenta [59].

Uterine prolapse

Prolapse of the uterus is a non-hereditary abnormal complication of the uterus usually expressed as the expulsion of the uterus through the vulva to the outside of the body which is occurring instantly after parturition and occasionally up to several hours afterward (Kumar et al., 2014). It is coming out of the uterus with or without vagina and cervix through the vulva commonly shortly after parturition and hang out with the inner surface outermost. Prolapse maybe caused by increased intra-abdominal pressure related to the increased size of the pregnant uterus, intra-abdominal fat or rumen distension supper inflicted up on relaxation and softening of the pelvic girdle, the excessive force of delivery or uterine inertia (the uterus stops contracting) due to metabolic problems (i.e., milk fever). Uterine prolapse is the most common obstetrical problem, influencing the productive and reproductive performance of cattle by reducing the postpartum return to estrus, conception rate, and calving interval in dairy cattle (Kumar and Yasotha, 2015) [59-61].

Prolapse is either partial or complete turning inside out of the organ, in which the inside comes to the outside through the lips of the vulva and hangs down, sometimes as far as the hocks (Ward and Powell, 2018). It is considered a medical emergency. This condition is life-threatening in animal species, particularly in cows. If the affected cow not treated promptly, she could go into shock or die from blood loss. If the uterine prolapse repaired correctly, the cow may uphold a normal reproductive existence. However, a secondary infection of the replenished uterus may make the cow slow to rebreed or unable to breed back at all (Ward and Powell, 2018) [62].

Cervico-Vaginal prolapse

It is defined as the inversion of the vagina only and sometimes with the cervix through the vulva. Not infrequently the entire vagina or cervix is prolapsed through the vulva. It is seen in all species of domestic animals, but commonly in the cow. It refers to a condition in which part of the entire vaginal wall protrudes from the vulva. It inclines to occur during mid to late gestation period, sometimes after delivery. Vaginal prolapse is more common than uterine prolapse and normally looks like a pink bulge of tissue ranging in size from a large grapefruit to a soccer ball. Precipitation of prolapse of genital organs implied multiple aetiologies but placental estrogen during the second half of gestation in cattle causing relaxation of the pelvic ligament; vulva and vulval sphincter muscle are most feasible suggestion although hereditary predisposition may not be undermined (Parikh et al., 2018). Similar to uterine prolapse, it occurs due to increased pressure in the abdominal cavity during the latter stages of pregnancy (Kahn et al., 2005). Older cows, cows carrying twins, and cows with Bos indicus ancestry are more prone to have vaginal prolapse. Cows restricted to grazing clover pastures could also be at a higher risk of vaginal prolapse due to phytoestrogens that may be produced by that forage type (Parikh et al., 2018) [63-65].

Uterine diseases

Metritis: The two main postpartum clinical conditions are metritis and endometritis. Metritis is occurred within 10 days of parturition and is characterized by an enlarged uterus containing a watery red-brown fluid to viscous off-white purulent uterine discharge, which habitually has a fetid odor (Sheldon and Owens, 2018). The severity of metritis is categorized by the signs of the animal's health, from mild disease to toxemia. The incidence of metritis varies between factors like breed, country, and herd, but in a study of the records from 97,318 cows in the

USA, the lactation incidence of metritis, including retained placenta, was 21% (Zwald et al., 2004). An important typical sign of metritis is a rectal temperature greater than 39.5°C within 21 days after calving. Retained placenta, fetal maceration, and dystocia are predisposing factors for the occurrence of puerperal metritis (Földi et al., 2006) [66-68].

Endometritis: Clinical endometritis is defined as inflammation of the mucus membrane of the uterus and the presence of a purulent discharge detectable in the vagina three weeks of parturition, or mucopurulent discharge visible in the vagina after 26 days post-partum (Turk et al., 2011). After parturition, endometritis continues to be a major cause of poor fertility and delayed conceptions (Couto et al., 2013). The incidence of clinical endometritis is around 10 to 20% worldwide, with variation between breed, country, and herd; a typical study reported that 16.9% of 1,865 cows were affected in Canada (LeBlanc et al., 2002). The risk factors most often associated with uterine infection are those that likely lead to some trauma to the endometrium, comprising stillbirth, twins, male and beef sire calves, dystocia, cesarean section operation, and retained placenta (Potter et al., 2010) [35-40]. The causes of endometritis are multifactorial and extensive. During the last 2 weeks of pregnancy and the first 3 weeks postpartum, the immune function of the dairy cow is repressed. Immediately post-calving there is bacterial contamination of the uterus which usually persists for 2 to 3 weeks. This is an expected and natural occurrence as the cervix dilates and the vestibule and vagina relax, resulting in the natural barriers and bacterial defenses being temporarily impaired. Retention of fetal membrane, injury to the reproductive tract due to the difficulty in calving or excessive force used to assist at calving or injury at the time of breeding or uterine treatment contamination of the reproductive tract at calving, over conditioning which may predispose cows' to many health problems at the time of parturition is a predisposing factor for endometritis (Gilbert, 2016). Clinical and subclinical endometritis negatively affects the performance of the world's dairy industry; economic losses are related to delay in the resumption of ovarian activity, increased number of services per conception, decreased milk yield, and costs of treatment of the disease (Cheong et al., 2011) [42-49].

Pyometra

Pyometra is characterized by the accumulation of purulent or mucopurulent fabric within the uterine lumen and distension of the uterus, in the presence of a closed cervix and an active corpus luteum (Sheldon et al., 2008). Postpartum pyometra is uncommon, with an incidence rate of less than 2%, and is thought to be caused by the growth of pathogenic bacteria in the uterine lumen after the formation of the first corpus luteum on the ovary. Although there is a functional closure of the cervix, the lumen is not always completely occluded, and pus may occasionally discharge from the cervix into the vaginal lumen. In ultrasonography, pyometra characterized by mixed echo density fluid in the uterine lumen with distension of the uterus, and a corpus luteum in an ovary (Sheldon et al., 2006). Delaying of the luteal phase may be attributed to increased concentrations of luteotropic prostaglandin PGE2 associated with an endometrial bacterial infection. Pyometra can happen if ovulation occurs too early in the post-partum period and corpus luteum is formed during uterine infection (Sheldon et al., 2008) [68].

Conclusion

Maintaining reproductive health and identifying potential problems in production and reproduction areas is critical in dairy cattle. Because reproductive health is the most important condition that determines the productive life performance of cows and immune function of the cattle is also important in minimizing the risk of health problems. The goal of dairy operations is to maximize milk yield per cow through genetic selection and artificial insemination. However, this goal is not fully attained due to multifactor hindering reproduction. Anoestrous, abortion, dystocia, repeat breeding, RFM, and uterine diseases are reviewed as major factors affecting the reproductive performance of dairy cows, So that, awareness creation, improved post-partum management including proper feeding, cleanliness, good hygiene, accurate heat detection, AI service as well as health management should be improved to minimize the occurrence of reproductive problems and associated economic losses in dairy cattle.

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