



Research Paper

## Prevalence of Reproductive Disorders in Beef Cattle in Payakumbuh City

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**ABSTRACT:** Reproductive disorders are the main cause of decreased fertility in cattle which reduces the production age of cows which results in economic losses. The purpose of this study was to determine the prevalence of reproductive disorders in cattle in Payakumbuh. The data in this study are secondary data obtained from iSIKHNAS related to UPSUS SIWAB from 2017-2019. Data were analyzed using Microsoft® Office Excel 2010 by looking for the prevalence of reproductive disorders in cattle in Payakumbuh City. The results showed that cases of reproductive disorders that occurred in Payakumbuh City were endometritis, ovarian hypofunction, dystocia, persistent corpus luteum, retention secundinarum, prepubertal anestrus, silent heat and anestrus. The percentage of cure rates for cases of reproductive disorders in cattle in Payakumbuh City from the highest to the lowest was in 2018 (61.64%), 2019 (56%) and 2017 (50.39%), while the percentage of pregnant women recovering from the highest to the lowest were in 2017 (82.17%), 2018 (77.97%) and 2019 (14.66%).

**KEYWORDS:** cattle, prevalence, reproductive disorders, reproductive performance

Received 10 Jan, 2022; Revised 23 Jan, 2022; Accepted 25 Jan, 2022 © The author(s) 2022.

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### I. INTRODUCTION

The success of cattle production depends on the reproductive system which will affect the increase in the cattle population. Up to now, the condition of cows in people's farms often results in reproductive disorders, which are characterized by low fertility of the broodstock. Reproductive disorders result in a decrease in pregnancy rates and a decrease in the number of births, thereby affecting the decline in the cattle population. Reproductive disorders are changes in the reproductive function of normal female cows. Management of cattle rearing that does not both in terms of feeding, environment maintenance, disease prevention, and Child weaning can be a cause reproductive disorders. according to [1] cows fed high-quality feed low greatly affects the situation reproduction. [2] stated that the incidence of repeated mating of dairy cows in farmer level as much as 29.4%, which happened as a result of pregnancy disorders, the environment poor and low farmer knowledge. Repeated mating due to the presence of bacteria inside uterus as much as 37.9%, and other factors as much as 62.2% [3]. In heifers, 20% cows re-breeding caused by infection uterus [4], whereas reproductive disorders in the parent, as the result of the old calf not being weaned is anestrus longer post parturition which results in calving longer intervals [5].

Based on the disturbances that occurred at the Directorate General of Livestock and Animal Health in 2017 that the cause was insemination handling and services that were not in accordance with the procedures that caused reproductive disorders such as inflammation of the reproductive tract (endometritis and metritis), persistent corpus luteum (corpus luteum persistent/CLP), and ovarian hypofunction. Based on research conducted in West Java Province and in Rembang Regency, cases of endometritis reproductive disorders (11.44%), persistent corpus luteum (8.48%), repeated mating (6.07%), hypofunction ovaries (6.25%) were found), cystic ovaries (1.25%), inactive ovaries (2.50%), and abnormal uterus (2.50%) [6] [7]. Treatment of reproductive problems is usually symptomatic based on clinical symptoms that appear. The criteria for successful handling of disturbances is if the condition of the livestock that has been carried out has been treated for reproductive disorders can show normal estrus and are ready for artificial insemination (IB) [8]. Reproductive health services by applying knowledge about reproductive health can help reduce the number of reproductive disorders and increase the special efforts of mandatory pregnant sires (UPSUS SIWAB). Based on this background, it is important to study related to reproductive disorders in beef cattle in Payakumbuh City.

## II. MATERIAL AND METHODS

### Research sites

This research was conducted on beef cattle farms in Payakumbuh City by conducting a case study on reproductive disorders in beef cattle. Geographically, Payakumbuh City is located at positions 0 – 10 to 0 – 17 South Latitude and 100 - 35 to 100 - 48 East Longitude. This area has an area of 80.43 km<sup>2</sup> or equivalent to 0.19% of the area of West Sumatra Province.

### Method

This research is an observational study with a study design using a cross-sectional study by analyzing data from the Indonesian animal health information system (iSIKHNAS), namely data from 2017 – 2019 related to activities to overcome reproductive disorders, therapy/medication, case development, cure rate, artificial insemination and pregnancy checks carried out by Payakumbuh City field officers.

### Data analysis

Data from the collected questionnaires were analyzed by univariate analysis by looking at the descriptive of each questionnaire variable. Data from iSIKHNAS related to UPSUS SIWAB from 2017-2019 were analyzed using Microsoft® Office Excel 2010 by looking for the prevalence of reproductive disorders in cattle in Payakumbuh City calculated by the formula:

Prevalence = number of positive cases / total population x 100%.

## III. RESULT AND DISCUSSION

### Cases of reproductive disorders in cattle in Payakumbuh City in 2017-2019

The results showed that from iSIKHNAS data from 2017 to 2019 there were many cases of reproductive disorders that caused reproductive failure in cattle in Payakumbuh City. Cases of reproductive disorders that occurred in Payakumbuh City were endometritis, ovarian hypofunction, dystocia, persistent corpus luteum, retention secundinarum, prepubertal anestrus, silent heat and anestrus. Table 1 Figure 1.

Table 1. Types of reproductive disorders in cattle in Payakumbuh City

Types of reproductive disorders	Prevalence (%)		
	2017	2018	2019
Endometritis	33.98	34.87	30.53
Ovarian hypofunction	48.83	38.22	16.42
Dystocia	-	9.87	12.42
<i>Corpus Luteum Persisten</i>	-	0.48	21.89
Retensio Secundinarum	2.34	4.94	11.79
Anestrus Pre Pubertas	-	9.08	6.95
<i>Silent Heat</i>	14.84	1.11	-
Anestrus	-	1.43	-
Total	100	100	100

Based on these results, there are three cases of the highest reproductive disorders in cattle in Payakumbuh City is endometritis. Endometritis has the highest prevalence when compared to ovarian hypofunction and dystocia. The highest prevalence of endometritis cases occurred in Payakumbuh City in 2018 (34.87%). This prevalence is higher when compared to studies conducted in West Nusa Tenggara and West Java with endometritis prevalence of 25.1% and 11.44% [7], [8]. Endometritis is an inflammation of the endometrial lining of the uterus that occurs due to a bacterial infection. In general, endometritis occurs after an abnormal birth such as abortion, retained placenta, dystocia, or continuation of inflammation of the outside (vulva, vagina and cervix). Clinical signs that appear as indicated by the discharge of dirty mucus during estrus to mucopurulent mucus continuously [9]. Endometritis with persistent, chronic, or subacute infection can affect fertility [10].

The highest prevalence of ovarian hypofunction in cattle in Payakumbuh City occurred in 2017 with a prevalence (48.83%). Ovarian hypofunction cases decreased until 2019 with a prevalence (16.42%). This prevalence is higher when compared to a study conducted on cattle in West Java Province with a prevalence of 32.57% ovarian hypofunction [7]. Ovarian hypofunction is a state of absence of ovarian activity in animals after giving birth [11]. [12]explained that ovarian hypofunction is the inability of the ovaries to perform their functions, which is usually caused by malnourished cows. Ovaries degenerate temporarily function in producing follicles. According to [13] ovarian hypofunction can be caused by failure of follicular cells to get hormonal stimulation, changes in both quantity and quality of hormonal secretion, and decreased stimulation associated with hypothalamic and pituitary function. This decrease in stimulation will cause a decrease in gonadotropin

secretion, so that there is no ovarian activity. Lack of nutrition will affect the function of the anterior pituitary so that the production and secretion of the hormones FSH (follicle stimulating hormone) and LH (luteinizing hormone) is low and causes the ovaries to not develop or experience hypofunction. Based on the reproductive disorders that occur in cattle with ovarian hypofungi, it means that there is an error in the mechanism of reproductive hormones. Mechanism errors can be caused by poor nutritional imbalance [1]. The high cases of ovarian hypofunction are caused by livestock body conditions, extreme environments and stress [14], [15]. Therapy for curing ovarian hypofunction is to synchronize estrus using progesterone given intravaginally or progesterone releasing intravaginal device [4].

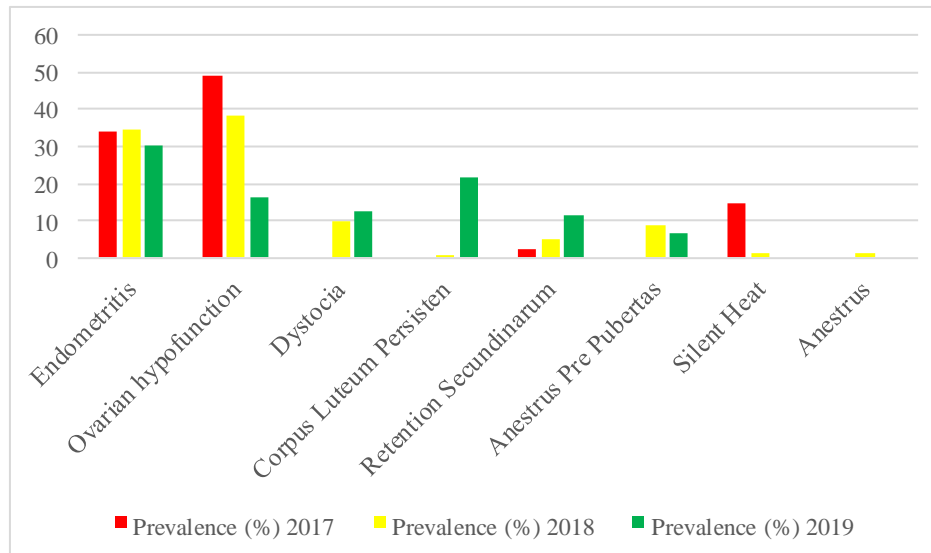


Figure 1. Overview of reproductive disorders in Payakumbuh City

The prevalence of dystocia in cattle in Payakumbuh City from 2017-2019 experienced an increase in cases where in 2017 there were no cases of dystocia, in 2018 the prevalence of cases (9.87%) rose in 2019 to (12.42%). This prevalence is higher when compared to cattle in West Java Province with a dystocia prevalence of 0.48% (20/4169) [7]. Factors that cause dystocia are parental factors which include nation, period of birth, amount of feed, body movement of the parent (exercise) outside the cage, reproductive disorders that have been suffered and trauma during pregnancy. Fetal factors that influence dystocia cases include fetal size, gender, fetal condition, and location of focus [16]. According to [11] stated that as many as 30% to 60% of cases of dystocia occur in the first birth, 8% to 25% in the second birth, and 2% to 8% in the third or more births. Dystocia is more common in cows giving birth for the first time (prempipara) than in cows that have given birth several times (pluripara). This is due to the stretching of the birth canal that the fetus has never passed. Secondary uterine inertia is the inertia of expulsion of the fetus and its success is more important than the cause of dystocia [17].

The prevalence of persistent corpus luteum cases in cattle in Payakumbuh City experienced an increase in cases, in 2017 there were no cases, while in 2018 with a prevalence (0.48%) and in 2019 it reached a prevalence (21.89%) cases. The prevalence of incidence in cattle in Payakumbuh City is higher when compared to reproductive disorders in cattle in West Java in 2017-2018 with a prevalence of 8.49% [7]. Persistent corpus luteum can be caused by pathological conditions in the uterus such as endometritis. Endometritis will inhibit the secretion of prostaglandins (PGF-2 $\alpha$ ) so that CL does not regress. Other conditions that cause CLP are toxic endometrial damage, pyometra, mummification, and maceration of the fetus. The clinical symptom of CLP that can be observed is that the female cow does not experience estrus in several oestrus cycles. Diagnosis to determine CLP by rectal palpation and gathering information about the estrus cycle of the cow [7].

The prevalence of retention secundinarum in cattle in Payakumbuh City is experiencing an increase in the prevalence of cases from 2017 to 2019 which is 2.34%, 4.94% and 11.79%. The prevalence of incidence in cattle in Payakumbuh is higher when compared to reproductive disorders in cattle in West Java with the prevalence of retention secundinarum 1.89% (79/4169) in West Java Province [7]. Retention secondary is a failure to detach the placenta fetalis (cotyledon villi) and the mother placenta (crypta caruncle) more than 12 hours after delivery. There are many factors that influence the case of retention secondary in cattle including dystocia, multiple births, abortion, age, parity, infection, malnutrition, hormonal disorders [18], [19]. The incidence of retention secundinarum increases in old cows with a birth period of more than four. Retention secondary can cause a number of problems by allowing microorganisms to grow in the uterus causing

inflammation, weight loss, decreased milk production, longer calving interval and if the infection is very severe it can cause death of the cow [20], [21].

The prevalence of prepubertal anestrus and anestrus cases in cattle in Payakumbuh City decreased in 2017 there were no cases, in 2018 the prevalence (9.08%) decreased in 2019 to (6.95%), while anestrus in 2018 with prevalence (1.43%) and in 2019 there were no cases. The prevalence of incidence in cattle in Payakumbuh City is higher when compared to reproductive disorders in cattle in West Java in 2017-2018 with a prevalence of 0.05% (2/4169) [7]. Anestrus is a condition in female animals that do not show symptoms of estrus for a long time. The absence of estrus symptoms can be caused by the absence of ovarian activity or due to unobserved ovarian activity. The state of anestrus can be classified based on the cause, namely normal anestrus, anestrus due to hormonal disorders, anestrus due to nutritional deficiencies, anestrus due to genetics [22]. According to [23] the absence of estrus or anestrus after mating (natural or AI) does not necessarily indicate that the cow is pregnant. Facts in the field prove that in the semi-intensive rearing system of Bali cattle on smallholder farms, estrus symptoms are often not observed or not observed by farmers. It is often assumed that the cow is pregnant. It is said that one of the factors causing physiological anestrus is a young cow (prepubertal anestrus). Puberty in cattle occurs at the age of 15 months, and has reached body weight of about 65% of adult body weight [24].

The prevalence of silent heat cases in cattle in Payakumbuh City in 2017 there were no cases, in 2018 the prevalence of cases (14.84%) decreased in 2019 was (1.11%). The prevalence of the incident in Payakumbuh City is lower when compared to the incidence of reproductive disorders in cattle in West Java Province in 2017-2018 with a prevalence of 28.75% (1199/4169) [7]. Silent heat is a condition in broodstock that does not show clinical signs of estrus or is not observed, but ovulation occurs in the ovaries or the release of eggs. The FSH hormone in the event of silent heat is able to grow follicles in the ovaries so that ovulation occurs, but it is not sufficient to encourage the synthesis of the hormone estrogen so that heat does not appear [25]. Cases of silent heat can reach 77% in the first post-partum ovulation, 54% in the second ovulation, and 30% in the third post-calving ovulation in high-producing dairy cows. The absence of a corpus luteum in the previous oestrus cycle results in very low concentrations of progesterone in the blood at the first ovulation after delivery. This causes the ovaries to be less responsive to hormones secreted by the anterior pituitary [11]. The therapy for silent heat uses vitamins and premixes to improve the nutrition and feed needed. Hormone therapy is also carried out using PGF-2 $\alpha$  and GnRH. One of the treatments for silent heat is to give worm medicine [26].

#### **The rate of recovery and recovery from pregnancy in cattle in Payakumbuh City**

The percentage of cure rates for cases of reproductive disorders in cattle in Payakumbuh City from the highest to the lowest was in 2018 (61.64%), 2019 (56%) and 2017 (50.39%), while the percentage of pregnant women recovering from the highest to the lowest were in 2017 (82.17%), 2018 (77.97%) and 2019 (14.66%) Table 2 and Figure 2.

**Table 2. Percentage of recovering and recovering from pregnancy in cattle in Payakumbuh City**

Years	Reproductive disorders (tail)	Healed (tail)	(%)	Get well pregnant (tail)	(%)
2017	256	129	50,39	106	82,17
2018	628	386	61,64	301	77,97
2019	475	266	56	39	14,66

Based on Table 5, the percentage of the highest cure rate was in 2018 (61.64%) and the percentage recovered from pregnancy in childbirth was in 2017 (82.17%). The percentage of this cure rate is higher when compared to the study in District of Fifty Cities, which was 36.50% [27]. Livestock that have reproductive disorders and have received treatment will report the progress of their cases as cured cattle if they have shown signs of lust and artificial insemination (IB) is carried out by the inseminator [27].

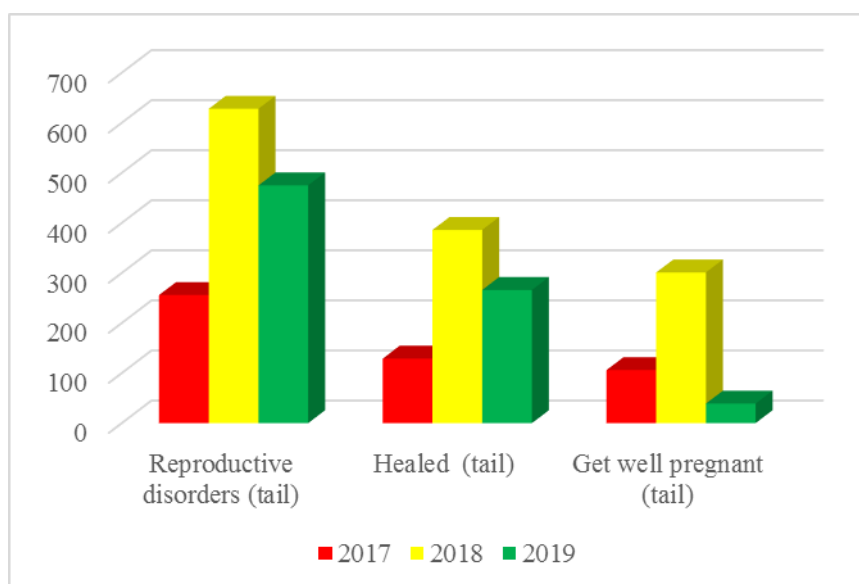


Figure 2. The cure rate of reproductive disorders in Payakumbuh City

In general, estrus cattle show symptoms of estrus on other cows, ride silently, discharge mucus from the vulva, the vulva looks reddish and slightly oed. However, not all cattle show the symptoms of estrus as above, some are only in the form of mucus discharge from the vulva and the vulva looks reddish, so observations must be carried out as carefully as possible every day. Knowledge of breeders about the estrus cycle is one of the important factors for the success of marriage. Farms who know about the estrus cycle will mate their livestock at the right time [28]. Detection of the correct estrus cycle in cows is the main key to the success of a marriage in addition to the accuracy and speed of mating, an effective examination of the estrus cycle in cattle requires complete knowledge of the behavior of cows when the estrus cycle is normal or not. Detection of estrus can generally be done by looking at the behavior of livestock and the state of the vulva.

Estrus in cattle usually lasts 12-18 hours. Variations are seen between individuals during the estrus cycle, cows in a hot environment have a shorter estrus period of about 10-12 hours. During or immediately after this period, ovulation occurs. This occurs with a decrease in the level of FSH in the blood and an increase in the level of LH. Just before ovulation, the follicle enlarges and the ovum in it matures. Estrus ends approximately at the time of rupture of the ovarian follicle or ovulation [29]. The duration of lust varies in each animal and between individuals within a species. This possibility is caused by variations in estrus, especially in cows with the shortest oestrus period among all mammals. Cessation of estrus after mating is a good indication that pregnancy has occurred [30].

The cure rate of cases of reproductive disorders in cattle depends on the complex interaction between environmental factors or management (nutrition), individual responses, types of reproductive disorders and the severity of reproductive disorders so that the healing response varies from each type of reproductive disorder [3], the criteria for successful handling reproductive disorders when the condition of cattle that have been treated with reproductive disorders can show normal estrus and are ready for artificial insemination.

#### IV. CONCLUSION

Types of reproductive disorders in cattle in Payakumbuh City are endometritis, ovarian hyfofunction, dystocia, persistent corpus luteum, retention secundinarum, prepubertal anestrus, silent heat, and anestrus. The percentage of cure rates for cases of reproductive disorders in cattle in Payakumbuh City reached (61.64%) and the percentage recovered from pregnancy reached (82.17%).

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