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## **Clinical Treatments of Reproductive Disorders on Dairy Cows Under Smallholder Rearing System in Enrekang Regency**

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### **Abstract**

The main problem with dairy farming in Indonesia, especially in remote areas, is that it is still facing various obstacles that have an impact on the productivity of large livestock. Reproductive efficiency determines the productivity, profitability, and sustainability of any livestock business. The presence of reproductive disorders causes reproductive inefficiency. Therefore, disease management needs attention because disease can change the production process and cause losses. The purpose of this research is to determine the incidence of reproductive disorders, the types of reproductive disorders, and the type of appropriate handling of reproductive disorders in the Panette Hamlet, Lebang Village, Cendana Sub-district, Enrekang Regency, South Sulawesi. Data analysis is presented in the form of percentages using descriptive statistical methods. The cows used were dairy cows with indications of reproductive disorders. Percentage of dairy cattle is identification, types of reproductive disorders in dairy cows, and handling of the results of treatment of livestock experiencing reproductive disorders. The parameters observed were the proportion of non-pregnant livestock experiencing reproductive disorders and the types of reproductive disorders.

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The results of this study showed that cases of reproductive disorders in Panette Hamlet, Lebang Village, Cendana Subdistrict, Enrekang Regency, South Sulawesi were quite high at 54.3%. The highest cases of reproductive disorders were silent heat (60%), CLP (20%), luteal cyst (12%), and pyometra (8%). Treatment or handling of PGF2 PGF2 $\alpha$  Hormone preparations, antibiotics (sulfadiazine, trimethoprim, and oxytetracycline), ADE vitamins, and NSAIDs (dipirone lidocaine) in reproductive disorders obtained quite high results of 68%, as seen from the reappearance of estrus results.

**Keywords:** Dairy cows; Reproductive efficiency; Reproductive disorders; Management.

## **1. Introduction**

Enrekang Regency is the only milk-producing area in South Sulawesi Province, Indonesia. Enrekang Regency is located at 3°14'36"–3°50'0" South Latitude and between 119°40'53"–120°6'33" East Longitude. The land altitude is about 1000–3000 meters above sea level, the average rainfall is 3000 mm/year, and the average daily temperature is between 22.1 and 23.2 °C [1].

Enrekang's environmental conditions are suitable for tropical agricultural activities including horticulture, plantation, and animal farming. For animal farming, highland environmental conditions create suitable conditions for dairy farm activity, making Enrekang one of the largest dairy farm development centers outside of Java Island. In 2014, it was designated as a dairy cattle development area by the Agriculture Ministry of Indonesia [2].

Dairy farms are generally under smallholder-scale management, with populations ranging from 5 to 20 heads per herd. However, the dairy cattle development in the last ten years indicates no significant progress; the population growth decreased by about 30% from 2.198 in 2012 [3] to 1026 in 2022 [1].

The decline of the population is possibly influenced by various constraints like disease, poor nutrition, low genetic potential, traditional rearing methods (management system) [4], and various reproduction disorders [5]. Reproduction disorders in dairy cattle are a major problem due to their effect on production stability and sustainability and their economic loss for farmers [6]. It is found either in large or smallholder management systems [7]. In the same research area, Yusuf and colleagues [8] reported that several reproduction disorders were found in cows and heifers in Enrekang; the incidences were uterine infection, inactive ovary, cyst, and urovagina.

Reproductive health programs are effective in maintaining and improving the reproductive efficiency of dairy herds. The common reproductive abnormalities in dairy cows may be controlled effectively with improved management practices and the appropriate administration of pharmacological and biological agents [9]. PGF2 $\alpha$  is effective in the management of silent heat [10], uterine disease, and abnormal pregnancy [11], whereas GnRH is a reliable treatment for ovarian cysts [12] and may be useful to improve conception in repeat breeders. The incidence of uterine disease can be minimized by eliminating or reducing factors that predispose to retained placenta and by appropriate treatment of affected cows [9]. This research aimed to indicate the evidence and assess the effectiveness of clinical treatments for reproduction disorders in dairy cows.

## **2. Materials And Methods**

### **2.1. Materials**

This research was conducted from December 2022 to April 2023 and the research material used was all dairy cows in Panette Hamlet, Lebang Village, Cendana Subdistrict, Enrekang Regency, South Sulawesi Province. The treatment experiment used dairy cows with the status of indications of reproductive disorders. Materials and tools used in this study include; PGF2 $\alpha$  hormone, vitamins, antibiotics, NSAIDs, 70% alcohol, iodine, cotton, tissue, vaseline, plastic glove, vaginoscopy, 10 ml syringe, small bucket, flashlight, ultrasound and camera.

### **2.2. Methods**

Preliminary observations through surveys were conducted to determine and record data on dairy cows, followed by a clinical examination. A clinical examination was conducted by an Assistant Reproductive Technical (ART) Officer to assess general reproductive health, pregnancy, reproductive disorders, and body condition score measurement (scale 1–5) (Edmonson and colleagues 1989). Per rectal palpation to determine ovarian status and uterine condition. Cows are diagnosed as having uterine development if indicated. Conversely, if no uterine development is indicated but there is a corpus luteum (CL) or dominant follicle (DF) in the ovary, it is considered a normal reproductive cycle. An ovarian cyst was defined as one or more follicle-like structures >25 mm in size. An ovary without follicles >10 mm is indicated as an inactive ovary. A vaginoscopy was used to determine abnormalities in the vaginal area. At a later stage, non-pregnant dairy cows will receive treatment for reproductive disorders according to the type of disorder identified.

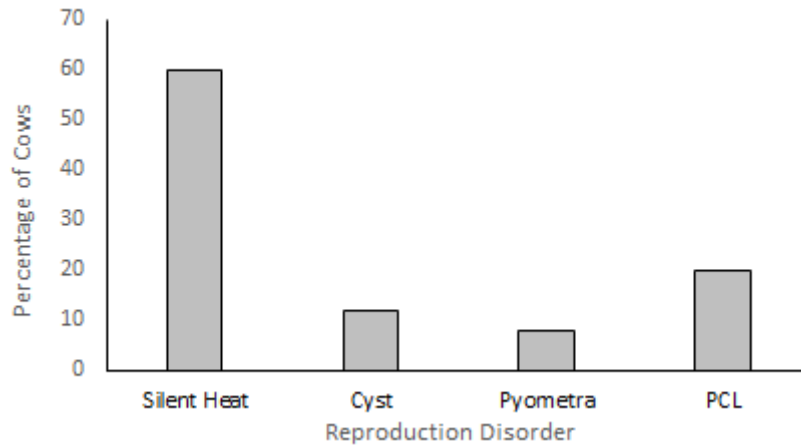
### **2.3. Data Analysis**

The data in this research is presented in percentage form using descriptive statistical methods. The percentage of dairy cattle is determined by the identification, types, and handling of the results of treatment of livestock experiencing reproductive disorders.

## **3. Results and discussion**

### **3.1 Results**

The results showed that the evidence of reproductive disorders in cows in this study can be seen in Figure 1. There were 25 (54%) cases found. Silent heat was the most common reproductive disorder (60.0%), followed by persistent corpus luteum (20%), ovarian cysts (12%), and pyometra (8%).



**Figure 1:** The evidence number of reproduction disorder on cows.

Standard clinical management is performed on cows with reproductive disorders. Successful treatment was characterized by the appearance of estrus. The results showed that 68% of cows responded to estrus, and the remaining 32% did not respond to estrus.

**Table 1:** Treatments and estrus responses.

Reproduction Disorders	Treatment	Estrus Responses		Total
		Estrus	Un-estrus	
		--%--		
Silent Heat	Proper nutrition +, PGF2 $\alpha$ 3ml/400kg BW and Vitamin A-D-E 2,5ml/100kg BW.	48	12	60
Luteal Cyst	Antibiotic, Oxytetracycline 1ml/10kg BW+ PGF2 $\alpha$ 3ml/100kg BW	9	3	12
Pyometra	Antibiotic, Sulfadiazine 1000mg Trimethoprim 200mg intra uteri +PGF2 $\alpha$ 3ml/400kg BW + Vitamin A-D-E 2,5ml/100kg BW.	3	5	8
PCL	Antibiotic, Oxytetracycline 1ml/10kg BW, dipirone lidocaine 10ml/200kg BW, + PGF2 $\alpha$ 3ml/400kg BW + multivitamin A-D-E 2,5ml/100kg BW	8	12	20
<b>Total</b>		<b>68</b>	<b>32</b>	<b>100</b>

The treatments were according to the symptoms of reproductive disorders shown. For silent heat cows, the treatment given was proper nutrition, hormonal administration (PGF2 $\alpha$  3ml/400kg BW) and Vitamin A-D-E 2,5ml/100kg BW; for luteal cysts, PGF2 administration (3 ml/100 kg BW) and oxytetracycline (1 ml/10 kg BW) antibiotic; for pyometra, antibiotic administration (sulfadiazine 1000 mg; trimethoprim 200 mg intra uteri); hormonal with PGF2 3 ml/400 kg BW and vitamin A-D-E 2,5 ml/100 kg BW); and for persistent corpus luteum (PCL) was antibiotic administration (Oxytetracycline 1 ml/10 kg BW; dipirone lidocaine 10 ml/200kg BW); hormonal (PGF2 3 ml/400kg BW); and multivitamin A-D-E 2,5 ml/100kg BW. Most cows were diagnosed as having a silent heat show estrous response (48% vs. 12%), followed by luteal cysts with 9% vs. 3% estrous responses, and an unestrous response. Cows suffering from pyometra and persistent corpus luteum (PCL) showed lower estrous responses, with 3% vs. 5% on pyometra and 8% vs. 12% on PCL.

### **3.2 Discussion**

Silent heat is the term used when a cow that has already shown heat signs shows them again after 6 weeks or later. The regular heat period of 3 weeks is often referred to as the silent heat. The heat signs might have been weak and therefore not observed. If the cow has been inseminated before, it might have had an early abortion so that she shows heat signs again 6–9 weeks after the last insemination [13]. It is also defined as the lack of behavioral estrus symptoms, although the genital organs are undergoing the normal cyclical changes. It is the main reason for post-partum anestrus in dairy cows, causing elongation of the service period and, in consequence, substantial economic losses [10]. The factors causing silent heat are low BCS [14], hormonal disturbances, environmental stress [15], infections in the reproductive organs, or pathological changes in the reproductive system [16].

Luteal cystic ovary disease is characterized by enlarged ovaries with one or more cysts that have walls thicker than follicular cyst walls because of a lining of luteal tissue. The incidence ratios of follicular versus luteal cysts vary greatly because of differences in the diagnostic skills of individual veterinarians. Typically, luteal cystic ovary disease is defined as the presence of a fluid-filled ovarian structure > 25 mm in diameter with a wall diameter > 3 mm, persisting > 10 days in the absence of a corpus luteum, and usually associated with abnormal reproductive signs. The normal formation of lacunae in the corpus luteum may be incorrectly classified as luteal cystic ovary disease [17]. Ovarian cysts are one of the most common ovarian dysfunctions in dairy cattle, and anestrus is the most significant clinical sign observed in dairy cattle suffering from this condition [18]. Ovarian cyst occurrence is possibly increased by increasing the lactation yield. Fleischer and colleagues reported that the number of cows with ovary cysts and lactation yield have a significant relationship ( $P < 0.001$ ) [19]. A higher milk yield may also increase the risk of developing ovarian cysts [20]. The chance for recovery from cysts that develop in early postpartum is higher for cows with lower production; most cows with ovarian cysts in their first lactation spontaneously recovered rather than older cows [21].

Pyometra is characterized by the accumulation of purulent or mucopurulent exudate in the uterus. In cows, it is invariably accompanied by the persistence of an active corpus luteum and an interruption of the estrous cycle. In affected mares, the cervix is often fibrotic, inelastic, affected by transluminal adhesions, or otherwise impaired. Mares may continue to cycle regularly, or the cycle may be interrupted. Discharge from the genital tract may be absent or intermittent, corresponding to periods of estrus. In general, affected animals do not exhibit any systemic signs of illness, but affected mares may be in poor condition. In both cows and mares, pyometra must be distinguished carefully from pregnancy before beginning treatment [22].

Persistent corpus luteum (CLP) is a condition in which a large corpus luteum continues to function to produce progesterone for a long time. This situation results in a negative feedback mechanism against the hypothalamus so that the secretion of FSH and LH hormones by the anterior pituitary is inhibited, which results in no new follicle growth in the ovaries. Failure to grow new follicles in the ovary causes the hormone estrogen not to be secreted and causes anestrus for a long time. Clinical symptoms that can be seen are anestrus for a long time and a corpus luteum that persists for more than one estrus cycle with a hard consistency [23].

Our clinical treatment to help animals suffering from reproduction disorders was a combination of proper nutrition, hormonal or antibiotic administration, and vitamin A-D-E, which was more simple and relatively recent in the availability of pharmacological agents. Proper nutrition is mainly aimed at increasing the body's condition. A good body condition will lead to better animal performance. The BCS has a correlation with fertility and reproduction efficiency; cows with a low body conditional score seem to have longer days open (estrus) and first service, even though they had a higher service per conception [24]. Cows with higher loss of body condition and elevated NEFA (non-esterified fatty acids) concentrations had higher P4 concentrations during estrus, reduced estrous activity, and a lower insemination rate [25]. The body condition score is an indication of the animal's health condition. Dairy cows require energy and nutrients to meet their basal needs, milk production, and reproduction. Unproper nutrition will have an impact on decreasing the body's condition.

#### **4. Conclusion**

Based on the results of the research conducted, cases of reproductive disorders in Panette Hamlet, Lebang Village, Cendana Subdistrict, Enrekang Regency were quite high at 54.3%. The highest cases of reproductive disorders were silent heat (60%), CLP (20%), luteal cyst (12%), and pyometra (8%). Treatment or handling by giving PGF2 $\alpha$  hormone preparations, Antibiotics (sulfadiazine, trimethoprim, and oxytetracycline), ADE vitamins, and NSAIDs (dipirone lidocaine) in reproductive disorders obtained quite high results of 68%, which was seen from the appearance of estrus back results.

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All procedures performed in this study were approved by the Animal Ethics Committee at Hasanuddin University.

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