Research Article

Profile of Inseminators and Insemination Practices in Bali, Indonesia

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Abstract | Artificial insemination (AI) or depositionof sperm in the female cervix or uterine tract using instruments. The success of achieving pregnancy influenced by several factors, including the profile of the inseminators and the method used. The objective of this research is concerned with finding out the profile and current method used by inseminators in Bali, Indonesia. A total of 76 inseminator in Baliprovince, Indonesia were randomly selected as respondent. Data about inseminator profile and AI practices were collected using questionnaire. The result showed that all of the inseminators were male, most of them 41-50 years old and high school level graduate and all inseminators were married, had attended basic training, heat detection, evaluated the animal BCS, monitored the level of liquid nitrogen, checked thawing time, uses disposable plastic gloves. Most of inseminators were deposite the semenin the body of uterus. This study was the first scientific research on the profile of inseminators and insemination practices in Bali Province Indonesia. To improve skills inseminator, also it is recomended to perform training continuously.

Keywords | Artificial insemination, Bali, Profile, Practices

INTRODUCTION

Artificial insemination (AI) is the method in which the sperm artificially introduced into the female reproductive tract at the right time with the help of instruments for conception. In this process, normal offspring are generated by facilitating the meeting of gametes (Patel et al., 2017). AI is a technique considered as mostly employed for livestock improvement (Bols et al., 2010). AI is by the most effective breeding and common method for rapidly spreading desired animal genetics in a given population (Khalifa et al., 2014). The advantages of AI is used in livestock production, were increased efficiency, Increased safety for animals and farmers, Reduced disease transmission, Improving animals' productivity and AI is a powerful tool when linked to other reproductive biotechnologies such as sperm cryopreservation, sperm sexing (Patel et al., 2017). Also, economically AI, is profitable. There is no need for maintenance of breeding bull for a herd due to AI need

only a few best male as parents. AI is easy to employed at the herd level to improve reproductive efficiency in farm animals or introduce desired genetic traits. In Bali, AI has introduced for livestock started in 1977, since the establishment of the Baturiti Regional Insemination Center (BIBD) in Baturiti, Tabanan, Bali.

Bali cattle is one of the cattle played an important role in livestock development in Indonesia (Puja et al., 2018). Bali cattle is one of the important genetic resources of beef cattle for farmers in Bali. They are used for a draft animal, as capital to pay tuition school fees, accumulated socioeconomic status and, as the source of income of the farmer family. This will have a significant impact on an agriculture development program in Bali and other islands with dense population, and there is a tendency that the landowner wants to sell their farmland for housing or other purposes became is not economically sound anymore as the source of income of the farmer family.

According to the economic survey of Animal Health and Livestock Services, Bali Province, the total bali cow population in 2017 was 179,000 and in 2018 was 178,000. Recent reports indicated that the bali cattle has been declining continuously. To help improve the productivity and population, AI has potential benefit to productivity improvement and population. Although AI has been practiced since 1977 until now, the success rates are considered low. In other regions in Indonesia, AI services reported being well.

Several factors may influence the success of AI services under field condition. The health status of the animal, semen collection, assessment, and processing semen, transportation procedure and processing of semen during AI gun loading. , proper oestrus detection, and inseminated at the correct time, deposition semen site considerably influenced the success of AI (Bilkis et al., 2016) and also depend on the knowledge and technical expertise (Barth,1993). Mouffok et al. (2019) reported that the factor inseminators (technicality and availability), season, and environment, the animal (genetics) could affect the conception rate of artificial insemination. Inchaisri et al. (2011) reported the significant effect of inseminators and insemination practices employed on the success of AI. While studies and document on the AI rate in Bali remain limited or are unpublished. Therefore, the current study was aimed to find out the inseminators and insemination practices employed. Studying the inseminators profile and insemination practices employed in Bali will be profitable not only to Bali but also to other islands that having similar conditions.

MATERIALS AND METHODS

STUDY LOCATION
This observational study was conducted in eight regencies from Bali Province Indonesia. Data were collected from October to December 2018. Bali is Indonesia's main tourist destination. The island of Bali located in 3.2 km (2 mi) east of Java. The wide of land area in bali is 5,632 km². It has average temperature of 30 °C (86 °F) and an average humidity 85%. Bali was home to several large mammals. Although tourism produces the largest GDP output, agriculture is still main occupation of Balinese people.

SURVEY QUESTIONNAIRE
In this observational study, a questionnaire survey was used to find out data on the inseminators profile and insemination practices employed. The questionnaires were prepared to interview a total of 73 inseminators. In the survey, information included the profile of the inseminators, including age, marital status, sex, education, AI training, number and level of AI training, body condition score, heat detection, and time of insemination.

DATA ANALYSIS
The collected data from the inseminators were manually tabulated and was analyzed using SPSS V.23 software. All data were summarized using descriptive statics (Heath, 2000)

RESULT AND DISSCUSSION

INSEMINATORS PROFILE
Based on information on profile (Table 1) revealed that all the inseminators were male (100%). On \the level education, most inseminators were high school level (61%), 41-50 years old (55%), and all inseminators were married (100%). All inseminators had attended basic training of AI, and most of them had attended only one training (55%).

Table 1: Profile of Inseminators in Bali (n=73).

Parameter	N(%)
Sex	
Male	73(100
Female	0 (0)
Age	
31-40	6 (8.2%)
41-50	55 (75.3%)
Above 51	12 (16.4%)
Marital status	
Single	0
Maried	73 (100%)
Widowed	0
Education	
Elementary graduate	0
High school level	61 (83.6%)
College level	12 (16.4%)
Post-graduate	0
Level of Training Attended	
Basic	73 (100%)
Advanced	0

PRACTICES APPLIED BEFORE AI
Based on data (Tab1e 2), All of the inseminators (100%) checked oestrus before performing AI. The heat was checked and confirmed through the vulvar discharge. Out of 52.1% of the inseminators performing AI, 8-10 h after they know the onset of estrus of the animal and 32.9% inseminator practiced AI 10-14 h after the onset of estrus. The result of this study showed that all of the inseminators had measured the animal's BCS before performing AI

INSEMINATION PRACTICES AT THE TIME OF AI
The all of inseminators (100%) always checked the level of liquid nitrogen in a container before handling the straw.

Table 2: Practices applied before AI by inseminators in Bali (n=76)

Parameter	N (%)
Monitoring of estrus	
Yes	73(100)
No	0
Methods of monitoring estrus	
Vaginal dischard	73 (100)
Rectal palpation	0
Time of Insemination	
8-10 h after they are know the onset of estrus	38 (52.1%)
10-14 h after they are know the onset of estrus	24 (32.9%)
Above 14 h after they are know the onset of estrus	11 (15.1%)
Evaluated the animal's BCS	
Yes	73 (100%)
No	0

Table 3: Practices applied at the time of AI by inseminators in Bali (n=76).

Parameter	N (%)
Checking level of nitrogen	
Yes	73(100%)
No	0
Checking of thawing time	
Yes	73 (100%)
No	0
Technique of checking thawing time	
Watch	23 (31.5%)
Manual/mental counting	50 (68.5%)
Others	0
Duration of thawing (seconds)	
20-30	20(27.4%)
30-40	42 (57.5%)
Above 12	11 (15.1%)
Site of usual semen deposition	
Body of uterus	47 (66.4%)
Mid of servix	26 (35.6%)
Entrance	0
Use of disposible plastic gloves	
Yes	76 (100%
No	

All of the inseminators checked thawing time. Only 31.5% inseminators used a watch to checking thawing time, and 68.5% used manual/mental counting. All of the inseminators (100%) used disposable plastic gloves when performing AI. Out of 64.4% of inseminators were inseminated spermatozoa in the body of the uterus, and 35.6% were deposit in the mid cervix (Table 3).

DISCUSSION

In the present finding, the farmers were able to detect the estrus based on the sign of vulvar discharge. All of the inseminators always checked estrus before thawing the semen. To reach a successful pregnancy result, it is essential to pay attention that cow should be inseminated at the correct time in estrus. In order to successful pregnancy achieve, the farmer to ensure accuracy in oestrus detection and check for heat regularly in the herd.

In this study of 76 inseminators showed that 52.1% of them performed AI, 8-10 hours after the onset of estrus. The choosing of proper timing of the insemination, The success of AI can be maximized by choosing the proper timing time for AI concerning the onset of estrus. Various AI practices can considerably affect a female's fertility (Souames et al., 2015). To achieve the maximal conception rate is obtained when cows are inseminated, up to 6 hours after estrus (Mohammed, 2018). In cow inseminated at 10-24 hours after the start of standing estrus is considered optimal timing for AI (Yehala et al., 2018).

In this study, the preferred thawing time was 30 seconds in warm-water (37-38°C). The survivability of spermatozoa after cryopreservation is influenced by many factors such as thawing time before used. Today, most of recommending for the thawing procedure in bovine semen frozen was warmwater thaw methods for a 30 – 40 s before AI employed (DeJarnette and Marshall, 2005). The thawing semen time between the time allows more spermatozoa to survive the thawing process. Ybanez et al. (2017) reported that for the practices, checking thawing time and semen deposition may influence the success of AI.

This study revealed that all of the inseminators (100%) take the estimated the animal's BCS into consideration before performed AI, 89% of inseminators have estimated that a BCS ≤ 2 has a negative effect on fertility. Effect BCS on conception rate well documented. Pryce et al. (2001) have reported that inadequate the animal BCS have a negative effect on the pregnancy rate. Lower BCS are risk factors limiting conception rate (Kim and Jeong, 2019).

The present study revealed that inseminators in Bali preferred depositing semen in the uterine body (64.4%). The reason that depositing the semen in the uterine body is due obtained in training. Semen deposited in the uterine body has become a standard technique. Spermatozoa can be reaches the fertilization site quickly in the female reproductive tract and have a chance to fertilize an ovum that

is released earlier than normal (Patel et al., 2017). Many studies have reported significant increases in pregnancy rate during uterine body insemination compare to the mid cervix. Deposition site or placing semen within the uterine may affect nonreturn rates following inseminations, and the pregnancies may be achieved even if the side of ovulation is not known in (Mohanty et al., 2018). Depositing intracervical semen insemination was often performed resulting in reduced fertility (Lofes-Gatius, 2000).

CONCLUSION

The all of inseminator were male, most of them 41-50 years old and high school level and, all inseminators were married. Inseminator checking of estrus, and have measured the animal's BCS before performing AI. All of the inseminators were checking liquid nitrogen in the container at the level of liquid nitrogen, checked thawing time, used disposable plastic gloves and inseminators were deposited the semen in the body of the uterus. To improve the skills inseminator, it is recommended to the inseminators to attempt training continuously

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS CONTRIBUTION

All of the authors have read and approved the manuscript

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