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Practical Applications of Ultrasound for Pregnancy Diagnosis in Bali Cattle Herded Semi-Intensively in Maumere, NTT

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INTRODUCTION

Generally, real time, B-mode ultrasound scanner has become an essential part for veterinary reproduction applications. Diagnostic ultrasound seems to be a useful tool to study anatomical structures and to confirm echogenic pattern in reproductive organ (Holman et al, 2011). Many experiments showed that ultrasonography imaging has considerable beneficial for the evaluation of the internal structure of reproductive organ function in domestic animals (Beal *et al*, 1992) as it can be used as a non-invasive technique to evaluate animal reproductive health (Holman *et al* 2011). Pregnancy detection with ultrasonography provides more advantage compare to manual palpation because of its ability to detect early presence of embryo and its accuracy (Beal *et al*, 1992; Nation et al 2003). To the best of our knowledge, most of cattle farmers and veterinarians in Maumere have relied on one single method for detecting pregnancy in cows, that is, rectal palpation. However, this method has its limitation as it should be performed by a skillful technician to diagnose pregnancy as early as 40 days of gestation and it does not provide any information about the viability of the embryo or fetus. Therefore, this study aims to investigate pregnancy status of Bali cattle herded semi-intensively in Maumere, NTT by using ultrasonography.

The objective of the research was to study the practical uses of ultrasound for pregnancy detection in Bali cattle on B-mode ultrasound imaging.

MATERIALS DAN METHODS

20 adult local Bali cattle, 2-5 year old with approximately 200-400 kilograms body weight were used. These cattle were physically palpated. After palpation, the ultrasound imaging of reproductive organ was carried out using a B-mode, real time ultrasound scanner (Sonodop Digital Ultrasoud S-A4, PT. Karindo Alkestron) with a 7.5 MHz linear array transducer. Each reproductive organ, particularly pregnant uterus was scanned longitudinally to evaluate its echo texture (Figure 1).

RESULTS AND DISCUSSIONS

Ultrasound examination of these Bali cows uterus aims to either identify the stage of the oestrus cycle in non-pregnant cows or pregnancy stages in Bali cattle herded semi-intensively in Maumere.

The histology of the uterus can be determined by its echotexture appearance as the submucosa can be visualized as an anechoic beneath endometrium. As we found in, most of the farmers in Maumere are lack of information about the importance of knowing about early pregnancy detection in Bali cows, while early pregnancy diagnosis is crucial in determining fertility status of the herd. An early pregnancy diagnosis facilitates the detection of non-pregnant cows and enables them to be naturally mated by rotating system as many non-pregnant cows do not show heat or the heat is not detected by the farmer.

(a)   (b)

Figure 1. (a) Rectal palpation;
(b) Ultrasonography of Bali cattle

The significant finding obtained from this study was the identification of foetus and amniotic sac in the gestation period using trans rectal probes. An amniotic fluid or embryonic fluid was detected as the initial sign for pregnancy detection. The difficulty of detection on amniotic sac at the early stages may due to its size, probe position, probe incapability or technicians incompetency.

Exploring the whole uterus during early

pregnancy is important as the majority of endometrial surface is almost similar with the uterus of non-pregnant cow.
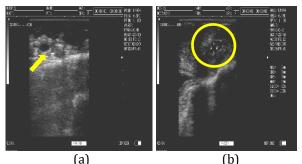

(a)   (b)
Figure 2. (a) Pregnancy re-check (either bovine follicle or embryonic vesicle); (b) Ultrasound at folicular phase (proestrus)

For an early pregnancy diagnosis, the uterus should be systemically explored to diagnose its pregnancy status (Figure 2). If this systematically procedure is followed, the diagnosis will be accurate. However, such accuracy will depend on the gestational age. After the 40 days of pregnancy, the reliability of pregnancy diagnosis is high.

Ideally, pregnancy is determining by imaging amniotic fluid, presence of placentome and identification of fetus. The bovine fetus can be seen as anechoic part where the uterine horn is hypoechoic zone (Figure 3a). Inside the amniotic fluid, 45 day to 60 day pregnancy was more highly echogenic than uterus appearance (Figure 3a, b).
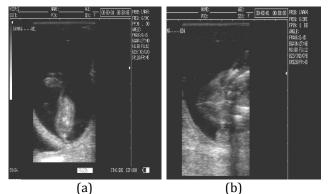

(a)   (b)
Figure 3. Ultrasound images of bovine pregnancy with high echogenicity of fetus; a. 45 day pregnancy; b. 60 day pregnancy

Ultrasonography is a more accurate tool compare to manual palpation for diagnosing and monitoring of pregnancy in Bali cattle. Its high sensitivity and specificity, makes it useful for determining either the stages of the oestrus cycle or the stages of pregnancy. Ultrasonography makes it possible to diagnose early pregnancy with a higher level of accuracy compare to traditional palpation.

CONCLUSIONS

Practical applications of ultrasound for diagnosis pregnancy in Bali cattle herded semi-intensively in Maumere can be used routinely to monitor reproductive performance as information gathering of ultrasonographic imaging that is far exceed rectal palpation. Such information may be benefit to make further decisions.

ACKNOWLEDGMENT

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