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Opinion Article

Ultrasonography for Reproductive Diseases and Disorders in Dairy Buffaloes

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Opinion

Female reproductive organs

The ovaries and uterus can be imaged transrectally in buffaloes using a 5.0-8.0 MHz linear scanner. Constante and Acorda [1] investigated the ultrasonographic appearance, measurements and echo mean values of the ovaries and uterus of buffaloes at various physiological states. In all stages, the ovaries were seen as non-homogenous hypoechoic ovoid structures with anechoic follicles. Ovarian mean measurements in animals in estrus were higher than in pregnant and non-pregnant animals. In non-pregnant and pregnant animals, the uterus was visualized as a thick hyperechoic band with homogenously hypoechoic lumen. Animals in estrus had thinner left horn wall than non-pregnant and pregnant animals. The echo mean values of the ovaries and uterus of animals in estrus were lower than non-pregnant and pregnant buffaloes. The udder can be examined directly through the transcutaneous technique utilizing 3.5-5.0 MHz linear, sector or convex scanner [2,3]. The udder can also be examined using gel application and standoff methods [4]. Examination of the teat is most commonly conducted through the water bath technique a 7.5 MHz linear scanner [2,3]. In the water bath method, the mammary gland is cleaned with antiseptic solution then dipped in a polyethylene bag filled with water and the scanner is applied on the outer wall of the polyethylene bag [4]. Rambadu et al. [3] observed gel application and water bath methods produced clearer ultrasound images than direct contact and stand-off methods. In the study by Constante and Acorda [5] on the ultrasound features of the udder and teat of water buffaloes at different stages of lactation, they observed that teat wall was thicker in early stage of lactation compared to the late phase and echogenicity of the udder wall, udder parenchyma and teat wall decreases with increasing days of lactation.

Uterine abnormalities such as abscesses, adhesions, tumors, hydrometra, mucometra, pyometra and abnormal uterine fluids can be diagnosed through ultrasonography. Pyometra is characterized by distended uterus with echogenic uterine fluid [6]. Ultrasound can also be used to determine the type of intrauterine fluid, purulence or mucous, detect small amount of fluid in subclinical metritis and identify origin of vaginal discharges due to metritis or vaginitis. Color Doppler sonography of the middle uterine artery has been utilized in determining the duration and degree of uterine torsion [7]. Ovarian and uterine pathologies not detectable by rectal palpation can be visualized through diagnostic ultrasound [8]. Ultrasonography has also been used to detect silent ovulation and anestrus [9] and early embryonic death in buffaloes [6]. Ultrasonographic appearance of subclinical mastitis include irregular contour of teat canal and sinus, overlapped papillary duct and rosette of Furstenberg, loss of the three-layered appearance of the affected teat wall and clear visualization of udder parenchyma and gland sinus. In clinical mastitis, ultrasound examination revealed loss of the three-layered appearance of the teat wall, complete obstruction of teat canal, thickened teat wall, disappearance of rosette of Furstenberg, irregular teat cistern filled with homogenous hypoechoic milk and anechoic milk alveoli filled with hypoechoic fluid [10]. Buffaloes with parenchymatous abscesses reveal complete obstruction of the teat canal and cistern with hyperechoic materials, multiple abscesses filled with hypoechoic or hyperechoic caseated pus and surrounded by hyperechoic thick capsules [10]. Other disorders than can be visualized through ultrasonography include udder lesions such as mammitis, varicosity, oedema, abscess, haematoma, atrophy and fibrosis and teat lesions including thelitis, intraluminal foreign bodies, intraluminal obstructions, teat stenosis, trauma/fistula, fibrosis and atresia [11].

Male reproductive organs

Ultrasonography of the testicles can assist the veterinarian in the diagnosis of various infertility infertility disorders [12]. However, there are very few studies on the use of ultrasound in buffalo bulls. Ultrasonography has been used to image ruptured urethra with scrotal swelling, malignant sertoli cell neoplasm, hydrocele, testicular hypoplasia and scrotal hernia in buffalo bulls [12]. In a study by El-Khawaga et al. (2012) on the effect of different doses of GnRH analogue on the bull's reproductive organs, they observed that the diameter of the testicle and width of epididymal tail did not differ significantly before and after treatment, the heights of the ampulla ductus deferens and seminal vesicle differed before and after treatments, the prostatic body differed after treatments, the pars disseminate of the prostate gland and the height of the bulbourethral gland did not differ regardless of the dose of treatment.

Conclusion

Although extensive studies have been conducted in reproductive diseases and disorders of the dairy cattle, very few studies have been conducted on the reproductive organs in buffalo. There is a need, therefore, to conduct ultrasonographic examination of the reproductive organs in in both male and female dairy buffaloes for diagnosis of diseases and disorders.

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