

OBSERVATIONS REGARDING ULTRASOUND DIAGNOSIS OF ANESTRUS SYNDROME IN DAIRY CATTLE

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Abstract

Visual transrectal ultrasonography is one of the most effective tools to study ovaries and uterine structures in cows. This study was conducted within a dairy cattle farm and aimed to highlight the importance of ultrasound examination for diagnosis of uterine and ovarian disorders in dairy cattle. During the study regarding ultrasound diagnosis of anestrus syndrome in dairy cattle, several types of genital pathologies were recorded. Thus, of all recorded uterine and ovarian disorders, 35 cases of endometritis (19.1%), 12 cases of acute metritis (6.5%), 26 cows with follicular cysts (14.2%), 21 cows with luteal cysts (11.5%), 42 cases of persistent corpus luteum (23%), 25 cows with ovarian inactivity (13.7%) and 22 cows with silent estrus (12%), were diagnosed. Reproductive tract ultrasound examination provides a more accurate identification and differentiation of ovarian and uterine disorders type, having a higher sensitivity and specificity than manual palpation, improving thus the diagnosis precision.

Keywords: *cattle, diagnosis, ovarian disorders, ultrasonography.*

Introduction

Application of transrectal real-time ultrasonography as a research tool to study bovine reproduction represents a technological breakthrough that has revolutionized our understanding of reproductive biology in cattle (Fricke, 2002).

This diagnostic technique (Palgrave et al., 2011; Saied et al., 2014; Purohit, 2014; Kumar et al., 2009) is one of the most effective methods of studying ovarian and uterine structures. According to Purohit (2010), ultrasonic technique allows also determining the geometric parameters of reproductive organs and detecting pathological processes, which may be indicated by fluctuations in echogenicity in the formation under visualization.

The aim of this study was to highlight the role of visual transrectal ultrasonography for uterine and ovarian disorders diagnosis, given that this diagnosis technique is more rapid, accurate and cost-effective.

Materials and methods

This study was conducted within a dairy cattle farm, from North Eastern of Romania, including 450 animals (Holstein Friesian Breed and Romanian Black Spotted Breed cows) between February and September 2016. The cows were kept in loose barns, and fed with grass and maize silage, concentrates, vitamin and mineral supplements. Total mixed ration or partial mixed rations feeding systems were used. A total of 120 dairy cattle were selected during this study, depending on the established diagnosis.

The examination procedure was performed by the same veterinarian for all the animals and included vulva, tail and perineum inspection, vaginoscopy, transrectal palpation and ultrasonography of the uterus and ovaries.

Cows were excluded from the study if they were diagnosed as being pregnant or if they recently calved. The presumptive diagnosis of anestrus was established based on transrectal examinations, the certainty diagnosis being established based on ultrasound examination, using the 5 MHz linear-array transducer (Vet Ultrasound Scanner WED 3000 V).

Results and discussions

During the study regarding ultrasound diagnosis of anestrus syndrome in dairy cattle, several types of genital disorders were recorded: 35 cases of endometritis (19.1%), 12 cases of acute metritis (6.5%), 26 follicular cysts (14.2%), 21 luteal cysts (11.5%), 47 cases of persistent corpus luteum (23%), ovarian inactivity was diagnosed in 25 cows (13.7%), and silent estrus in 22 cows (12%), summing up a total of 183 uterine and ovarian diseases (Figure 1).

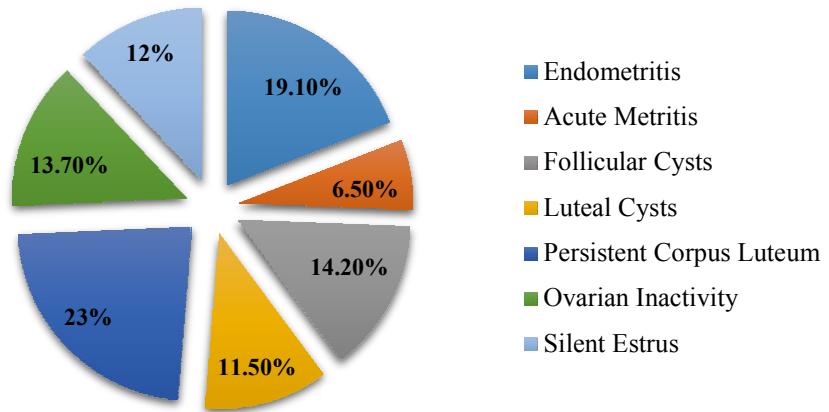


Fig. 1 Genital disorders frequency recorded within farm between February and September 2016

Of the total number of cows examined over the eight months of study, 40.7% of them had at least a genital pathology, our results being similar to those obtained by Tesfaye, which reported in a study conducted in 2013 a reproductive disorders frequency of 40.25%. Also, Hadush et al. (2013) reported a frequency of these pathologies of 44.3%, the results obtained in our study being similar to those mentioned by the literature.

Of all pathologies diagnosed between February and September 2016, endometritis and persistent corpus luteum were most commonly diagnosed. Cows with cervix diameter measurement higher than 5 cm and uterine horns containing an anechogenic fluid accompanied by echogenic particles of snowflakes aspect along with a thickened uterine wall and the presence of a persistent corpus luteum on one of the ovaries, led us to the diagnosis of endometritis (Figure 2).

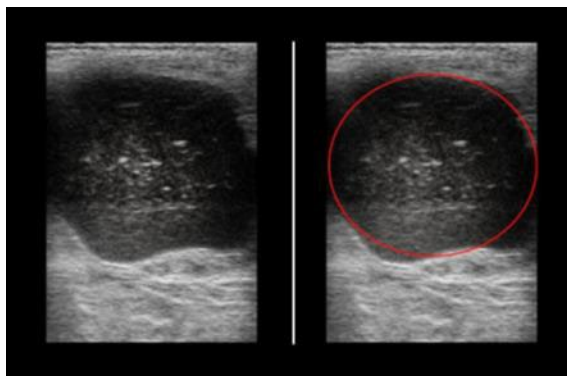


Fig. 2 Ultrasound aspects of endometritis in cows (original photo)

According to LeBlanc et al. (2002), cows with uterine cervix diameters higher than 5 cm after week 4 postpartum, developed uterine diseases; moreover, these cows may exhibit reduced fertility in the future.

Delayed uterine involution and uterine contamination with bacterial species in postpartum period are associated with uterine fluid accumulation, which is detected by ultrasound examination (Mateus et al., 2002). Similar ultrasound aspects were reported by other authors (Lenz et al., 2007, Kumar et al., 2009). The prevalence of silent estrus from the total number of animals diagnosed with ovarian and uterine disorders (183 cows) was 12.1% (22 cows), results sustained by Zdunczyk et al. (2005), who claims that the prevalence of silent estrus in cows varies between 10-40%.

In a fairly large proportion, persistent corpus luteum presence was identified in endometritis and pyometra, the appearance of this type of anestrus as a single pathology, being identified with a lower frequency (Figure 3).

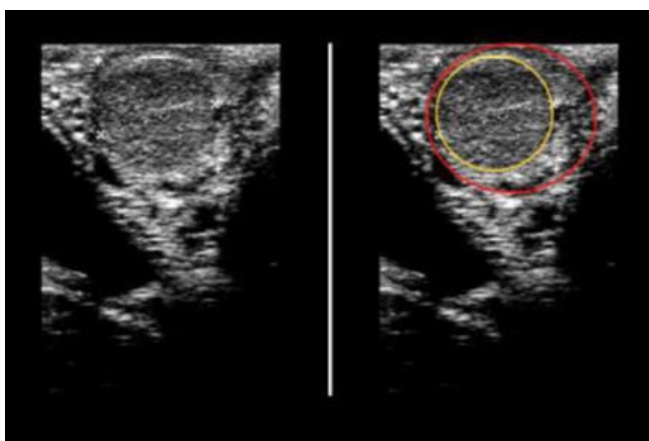


Fig. 3 Ultrasound aspects of persistent corpus luteum in cows (original photo)

According to Peter (2009), a contributing factor to persistent corpus luteum in dairy cattle is the absence of a dominant estrogenic follicle at the expected time of luteal regression, justifying thus the existence of a persistent corpus luteum as a single pathology in our study. Also, according to Opsomer (2000), parity, dystocia, heat stress, disorders from the first month postpartum, can extend the life of a persistent corpus luteum.

In cystic ovarian disease, which includes both luteal and follicular cysts, a higher frequency was recorded for follicular cysts (14.2% of all genital diseases), our results being similar to other authors (Durocher et al., 2005; Gaur et al., 2007). The diameters of diagnosed ovarian cysts in our study varied between 29 mm and 40 mm, the difference between these two conditions being based on cyst wall thickness (between 3 mm and 9 mm).

Thus, luteal cyst was considered to be an ovarian structure having a diameter higher than 25 mm whose wall has a thickness greater than 3 mm thick with an echogenic gray area around the cyst and whose presence has been identified at both ultrasound examinations (Figure 4).



Fig. 4 Ultrasound aspects of luteal cysts in cows (original photo)

Were classified as being cows with ovarian inactivity, animals in which during the two ovaries ultrasound examinations, no significant changes were observed in follicular structure, the characteristic presence of a persistent corpus luteum or a cystic follicular structure (Figure 5).

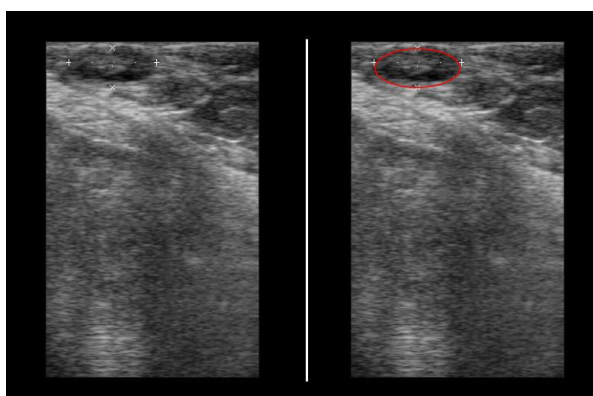


Fig. 5 Ultrasound aspects of ovarian inactivity in cows (original photo)

In our study, this pathology was identified in 5.6% (25 cows) of the total animals taken under study. The percentages recorded in our study are similar to those mentioned by the literature according to which, this pathology is expected to occur in less than 10% of postpartum cow population in a normal herd (Markusfeld, 1987).

Regarding the use of transrectal ultrasound for ovarian cysts and ovarian disorders diagnosis, Hanzen et al. (2000) reported that the use of this diagnostic method for identifying and differentiating ovarian cyst types has a much greater sensitivity and specificity than diagnosis using transrectal manual palpation method (66% versus 75% and 85%).

Conclusions

Reproductive tract ultrasound examination provides a more accurate identification and differentiation of ovarian and uterine disorders type, having a higher sensitivity and specificity than diagnosis using manual palpation of the same conditions, improving thus the diagnosis precision.

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