

BOOK REVIEW

Ultrasonic Imaging and Animal Reproduction: Color-Doppler Ultrasonography—Book 4 **O.J. Ginther, VMD, PhD** **Equiservices Publishing,** **2007, 258 pp.**

Order online: www.equipub.com.

There is no dispute that Dr. O. J. Ginther is the world's expert on reproductive ultrasonography. This is Book 4 in a series of ultrasonographic imaging. Most reproductive biologists, including myself, consider this series of books essential for gaining a better understanding of ultrasonography and reproductive biology. Book 4 has some major advances over its predecessors, which include full color throughout, including a color-Doppler-like color bar at the top outline of each page, color-coded summaries, and the words "horses" and "cattle" highlighted in red so that the species-oriented reader can focus on the species of interest. Also included are brief sections on human reproductive ultrasonography. This book contains spectacular ultrasound images, diagrams, and photographs. The summary sections provided at the end of each chapter are extremely useful and provide a quick overview of the material covered in each chapter.

The book is divided into five sections: part 1 contains the basics, part 2 is on ovaries, part 3 discusses the uterus and pregnancy, part 4 covers stallions and bulls, and part 5 is an ap-

pendix containing the bibliography and subject index.

Chapter 1 provides a description of the arterial systems, locating the ovarian and uterine arteries, hemodynamics, sedation and Doppler ultrasonography. This Chapter contains beautiful figures of both the mare and cow as well as B-mode ultrasonography scans of the uterine artery in the horse.

Chapter 2 goes through an excellent review of the principles of B-mode ultrasonography and a description of Doppler. For those who know very little of the principles of Doppler ultrasonography, chapter 2 provides a very detailed, easily understood description of Doppler effects.

Chapter 3 provides a description of how color-flow images are produced. Dr. Ginther indicates that Doppler images could be used to help the clinician make judgments concerning the ovulatory potential of large follicles, expected time of ovulation, status of the corpus luteum, and the likelihood of early embryonic death. Information also may be gained on the suitability of the follicle for producing an oocyte that will result in fertilization. There is a great summary in this chapter on the instrumentation for color-flow imaging with schematic drawings. In addition, Dr. Ginther provides information on adjusting a scanner for obtaining good color-flow images.

Determination of blood flow velocity by spectral mode is discussed in great detail in Chapter 4. Although this procedure may not be as popular as color-flow mode, this technique determines the extent of vascular perfusion in tissues, which has important implications.

The section on follicle blood flow, contained in Chapter 5, begins with a review of follicle selection and the deviation hypothesis. Studies are described concerning the changes in Doppler flow at the time of ovulation in both cycling mares and during the transition period. This chapter also contains information on Dr. Ginther's hypothesis regarding anovulation.

The corpus luteum (CL) is one of the most vascularized structures in the body. Dr. Ginther presents a summary of the information on blood flow to the CL in Chapter 6. He states that, in horses, there is no indication that either an acute increase or decrease in blood flow occurs before the decrease in progesterone. Studies on the temporal relationship between luteal development and regression and changes in luteal blood flow in horses and cattle are reviewed in this chapter. The color-flow images of the corpus luteum are absolutely stunning. The information on anovulatory follicles is particularly interesting and of clinical importance.

Chapters 7 and 8 deal with blood flow to the uterus and embryo. Chapter 7 deals with color-flow imaging during the estrous cycle and for the first 3 weeks of gestation. Dr. Ginther indicates that endometrial vascular perfusion was similar between non-pregnant and pregnant mares until an increase occurred in both horns of pregnant mares by day 12. Perfusion was greater in the horn of embryo fixation. He also presents in this chapter a uterine index that can be used to diagnose impending embryonic death in mares. Blood flow in older embryos and fetuses is presented in Chapter 8. Dr. Ginther discusses the possible role of abnormal blood flow in infertility.

Blood flow in the male genitalia in both the stallion and bull is presented in Chapter 9. Dr. Ginther states that studies in stallions were delayed until just recently. However, in men, Doppler flow is used to study development and pathology of the testis, scrotum, spermatic cord, and penis. In addition, blood flow assessment of the testicular artery can be quite useful.

In summary, this fourth book in the series on ultrasonic imaging is absolutely essential for those research scientists and clinicians interested in the possible application of color-Doppler ultrasonography.

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