Veterinary Bioscience: Metabolism

WEEK 5 – THE HEALTHY URINARY TRACT

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INTENDED LEARNING OUTCOMES

At the end of this lecture, you should be able to:

- describe how glomerular filtration occurs, why it is important and the factors that regulate it
- explain the process of autoregulation and the factors and hormones that regulate it
- explain how the glomerular filtration rate (GFR) can be measured and used as an assessment of renal function
- describe how urine is formed and modified through glomerular filtration, tubular reabsorption and secretion
- describe the composition of normal urine
- describe the transport mechanisms responsible for sodium reabsorption by the nephron
- explain the coupling of sodium and water reabsorption in the proximal tubule
- describe how organic ions are secreted and why this is important.

KEYWORDS

kidneys, nephron, glomerulus, glomerular filtration rate, afferent and efferent arterioles, glomerular filtration, macula densa, juxtaglomerular apparatus, autoregulation, tubules, reabsorption, secretion, urine composition, sodium, water

LECTURE 19 – STRUCTURE AND FUNCTION OF THE KIDNEYS 2 – AUTOREGULATION, GLOMERULAR FILTRATION AND URINE COMPOSITION

In this lecture, we will examine glomerular filtration in greater detail, and explore the glomerular filtration rate and the factors that influence and regulate it. We will also look at tubular handling of the filtrate and mechanisms of secretion and absorption along the nephron.

FURTHER READING

Hall JE. *Guyton and Hall Textbook of Medical Physiology.* 14th ed., Elsevier (2021)

Klein BG. *Cunningham's Textbook of Veterinary Physiology.* 6th ed., Elsevier (2020)