

# Introduction to Veterinary Science

*2nd Edition*



James B. Lawhead  
MeeCee Baker

# Contents

---

Preface ix

About the Authors xiv

Acknowledgments xv

## UNIT I ■ Comparative Anatomy and Physiology

---

|           |   |    |            |   |     |
|-----------|---|----|------------|---|-----|
| CHAPTER 1 | Basic Cell Biology  | 2  | CHAPTER 6  | The Renal System  | 84  |
|           | Cell Makeup .....   | 3  |            | Renal System Structures .....                                 | 86  |
|           | Cell Structure .....  | 5  |            | Renal System Functions .....                                  | 88  |
|           | Cell Function .....   | 8  |            | Kidney Structures and Urine<br>Formation and Regulation ..... | 89  |
|           | Protein Synthesis .....                                       | 10 |            | Urine and Blood Evaluation.....                               | 93  |
|           | Mitosis and Cancer.....                                       | 11 |            | Clinical Practice .....                                       | 96  |
|           | Mammalian Reproduction .....                                  | 12 | CHAPTER 7  | The Digestive System  | 101 |
|           | Clinical Practice .....                                       | 13 |            | Digestive System Structures .....                             | 103 |
| CHAPTER 2 | Tissue Types and Functions                                    | 17 |            | Monogastric Digestion .....                                   | 107 |
|           | Epithelial Tissues .....                                      | 19 |            | Species Variation .....                                       | 113 |
|           | Connective Tissues.....                                       | 22 |            | Clinical Practice .....                                       | 116 |
|           | Muscle Tissues .....  | 24 | CHAPTER 8  | The Reproductive System                                       | 122 |
|           | Nerve Tissues.....  | 27 |            | Male Anatomy and Hormonal Function....                        | 124 |
|           | Clinical Practice .....                                       | 28 |            | Female Anatomy and Hormonal<br>Function.....                  | 126 |
| CHAPTER 3 | The Musculoskeletal System                                    | 31 |            | Pregnancy and Parturition.....                                | 129 |
|           | Musculoskeletal System<br>Functions .....                     | 32 |            | Clinical Practice .....                                       | 134 |
|           | Bone Structure.....   | 33 | CHAPTER 9  | The Nervous System  | 141 |
|           | Joint Types and Movements .....                               | 34 |            | Neuron Function.....  | 143 |
|           | Axial and Appendicular Skeletons.....                         | 35 |            | Brain Structure and Function.....                             | 146 |
|           | Bone Growth and Remodeling.....                               | 42 |            | Anatomy and Function of the<br>Spinal Cord .....              | 147 |
|           | Relation of Bones, Muscles,<br>and Movement.....              | 43 |            | Sensory Somatic and Autonomic<br>Nervous Systems .....        | 148 |
|           | Clinical Practice .....                                       | 44 |            | Clinical Practice .....                                       | 153 |
| CHAPTER 4 | The Circulatory System  | 51 | CHAPTER 10 | The Endocrine System  | 158 |
|           | Blood Components and Functions.....                           | 53 |            | Endocrine System .....  | 160 |
|           | Mammalian Heart Structures.....                               | 57 |            | Endocrine Glands .....  | 161 |
|           | Blood Vessels and Blood Flow.....                             | 59 |            | Clinical Practice .....                                       | 168 |
|           | Electrocardiograms, Heart Sounds,<br>and Blood Pressure ..... | 62 | CHAPTER 11 | The Immune System   | 173 |
|           | Clinical Practice .....                                       | 67 |            | Antigens and Immunity .....                                   | 175 |
| CHAPTER 5 | The Respiratory System  | 73 |            | Immunity and Immune Response .....                            | 179 |
|           | The Respiratory Tract .....                                   | 74 |            | Clinical Practice .....                                       | 182 |
|           | Mechanisms of Breathing.....                                  | 78 |            |   |     |
|           | Clinical Practice .....                                       | 79 |            |   |     |

## **UNIT II ■ Nutrition**

---

|            |                         |     |  |     |
|------------|-------------------------|-----|--|-----|
| CHAPTER 12 | Basic Nutrients         | 188 | Equine Nutrition and Fiber Digestion ... | 206 |
|            | Nutrients .....         | 190 | Ruminant Nutrition and Fiber             |     |
|            | Clinical Practice ..... | 196 | Digestion.....                           | 208 |
| CHAPTER 13 | Species Comparison      | 200 | Clinical Practice .....                  | 211 |
|            | Animal Nutrition .....  | 201 |  |     |
|            | Pet Food Labels .....   | 202 |  |     |

## **UNIT III ■ Diseases**

---

|            |                                    |     |            |                         |     |
|------------|------------------------------------|-----|------------|-------------------------|-----|
| CHAPTER 14 | Principles of Infectious Disease   | 216 | CHAPTER 17 | Zoonoses                | 263 |
|            | Koch's Postulates .....            | 217 |            | Zoonotic Diseases ..... | 265 |
|            | Disease Agents .....               | 219 |            | Clinical Practice ..... | 271 |
|            | Clinical Practice .....            | 233 | CHAPTER 18 | Diagnosis of Disease    | 274 |
| CHAPTER 15 | Disease Prevention                 | 240 |            | Disease Diagnosis ..... | 275 |
|            | Disease Prevention .....           | 242 |            | Clinical Practice ..... | 284 |
|            | Vaccines .....                     | 244 |            |                         |     |
|            | Clinical Practice .....            | 246 |            |                         |     |
| CHAPTER 16 | Classification of Diseases         | 249 |            |                         |     |
|            | Disease in Clinical Practice ..... | 251 |            |                         |     |

## **UNIT IV ■ Surgery**

---

|            |                               |     |
|------------|-------------------------------|-----|
| CHAPTER 19 | Principles of Surgery         | 290 |
|            | Principles of Surgery .....   | 293 |
|            | Laceration Healing .....      | 296 |
|            | Surgical Considerations ..... | 300 |

ADDENDUM A Decision Making in Veterinary Science 307

ADDENDUM B Career Focus 314

Glossary 318

Bibliography 324

Index 328