## Contents

### Section I

#### Digestive System

*Allen J. RousseI, Jr., and David E. Anderson*

1. Pharyngeal Lacerations and Retropharyngeal Abscesses in Ruminants, 2  
   *D. Michael Rings*
2. Vesicular Diseases of Ruminants, 3  
   *Kevin E. Washburn*
3. Actinomycosis and Actinobacillosis, 6  
   *Allen J. RousseI, Jr.*
4. Esophageal Obstructions/Choke, 8  
   *D. Michael Rings*
5. Bloat or Ruminal Tympany, 9  
   *Robert N. Streeter*
6. Function and Dysfunction of the Ruminant Forestomach, 12  
   *Walter Grünberg and Peter D. Constable*
7. Rumen Indigestion and Putrefaction, 20  
   *Franklyn B. Garry*
8. Ruminal Acidosis and Rumenitis, 23  
   *Karl W. Kersting, James R. Thompson, and Maren J. Connolly*
9. Rumenotomy and Rumenostomy, 27  
   *Andrew Niehaus*
10. Abomasal Ulcers, 29  
    *Marie-Eve Fecteau and Robert H. Whitlock*
11. Abomasal Emptying Defect in Sheep, 34  
    *D. Michael Rings*
12. Pathophysiology of Displacement of the Abomasum in Cattle, 35  
    *David E. Anderson*
13. Displaced Abomasum in Cattle, 40  
    *Andrew Niehaus*
14. Prognostic Indicators and Comparison of Corrective Fixation Techniques for Displacement of the Abomasum in Dairy Cattle, 44  
    *Kenneth D. Newman*
15. Laparoscopic Abomasopexy for Correction of Left Displaced Abomasum, 48  
    *Kenneth D. Newman and David E. Anderson*
16. Hepatotoxicities of Ruminants, 51  
    *A. Catherine Barr*
17. Hemorrhagic Bowel Syndrome, 55  
    *David C. Van Metre*
18. *Clostridium novyi* (Myonecrosis, Black Disease, and Bacillary Hemoglobinuria) and *Clostridium septicum* (Bacillary Hemoglobinuria) Infections, 58  
    *J. Glenn Songer*
19. Clostridial Enterotoxemia (*Clostridium perfringens*), 62  
    *J. Glenn Songer*
20. Johne’s Disease (Paratuberculosis), 65  
    *Michael T. Collins*
21. Neonatal Calf Diarrhea, 70  
    *Jonathan M. Naylor*
22. Helminth Parasites of the Ruminant Gastrointestinal Tract, 78  
    *Thomas M. Craig*
23. Gastrointestinal Protozoal Infections in Ruminants, 91  
    *Thomas M. Craig*
24. Bovine Viral Diarrhea Virus, 96  
    *Paul H. Walz*
25. Salmonellosis in Ruminants, 106  
    *Virginia L. Mohler and John House*
26. Winter Dysentery, 112  
    *Linda J. Saif*
27. Duodenal Obstruction, 114  
    *David E. Anderson*
28. Trichobezoars, 116  
    *David E. Anderson*
29. Intussusception, 118  
    *David E. Anderson*
30. Intestinal Volvulus, 120  
    *David E. Anderson*
31. Intestinal Atresia, 122  
    *David E. Anderson*
32. Rectal Prolapse, 125  
    *David E. Anderson*

### Section II

#### Metabolic Diseases

*Thomas H. Herdt*

33. Milk Fever (Parturient Paresis) in Cows, Ewes, and Doe Goats, 130  
    *Garrett R. Oetzel and Jesse P. Goff*
34. Phosphorus Deficiency, 135  
    *Jesse P. Goff*
35. Ruminant Hypomagnesemic Tetanies, 137  
    *Jesse P. Goff*
Section III
Respiratory System

Jeffrey Lakritz and David E. Anderson

41 Mannheimia haemolytica- and Pasteurella multocida-Induced Bovine Pneumonia, 164
Douglas L. Step and Anthony W. Confer

42 Viral Diseases of the Bovine Respiratory Tract, 171
Robert W. Fulton

43 Mycoplasmas in Bovine Respiratory Disease, 192
Ricardo F. Rosenbusch

44 Ovine and Caprine Respiratory Disease: Infectious Agents, Management Factors, and Preventive Strategies, 194
Sherrill Fleming

45 Disorders of the Upper Respiratory Tract in Food Animals, 199
Jeffrey Lakritz, D. Michael Rings, and Bruce L. Hull

46 Surgery of the Larynx and Trachea, 207
David E. Anderson

47 Thoracic Surgery in Cattle, 209
David E. Anderson

Section IV
Cardiovascular Diseases

Kathryn M. Meurs

48 Examination of the Bovine Patient with Heart Disease, 214
Kathryn M. Meurs

49 Congenital Heart Disease in Cattle, 215
Kathryn M. Meurs

50 Acquired Heart Diseases in Cattle, 216
Kathryn M. Meurs

Section V
Musculoskeletal System Medicine

André Desrochers

51 Noninfectious Disorders of the Foot, 222
Sarel R. Van Amstel

52 Infectious Disorders of the Foot Skin, 234
Jan K. Shearer

53 Surgery of the Bovine Digit, 242
Karl Nuss

54 Small Ruminant Infectious Disease of the Foot, 251
Pascal Dubreuil

55 Fracture Management in Cattle, 253
Adrian Steiner and David E. Anderson

56 Septic Arthritis in Cattle, 259
David Francoz

57 Osteochondrosis in Cattle, 262
Pierre-Yves Mulon

58 Ligament Injuries of the Stifle, 264
André Desrochers

59 Coxofemoral Luxation, 268
André Desrochers

60 Hygroma of the Carpus and Tarsus, 271
Pierre-Yves Mulon

Section VI
Neurologic Diseases of Cattle, Sheep, and Goats

Gilles Fecteau and Lisie W. George

61 Clinical Examination, 274
Joane Parent

62 Ancillary Tests, 279
David Francoz

63 Muscular Tone and Gait Abnormalities, 283
Marie-Eve Fecteau and Raymond W. Sweeney

64 Cranial Nerve Abnormalities, 299
David Francoz

65 Mentation Abnormality, Depression, and Cortical Blindness, 307
Gilles Fecteau and Lisie W. George

66 Central Nervous System Infection and Infestation, 312
Gilles Fecteau and Lisie W. George

Section VII
Urinary System

Matt D. Miesner

67 Urolithiasis, 322
Meredyth L. Jones and Matt D. Miesner

68 Urinary Tract Infection in Food Animals, 325
Matt D. Miesner

69 Neonatal Urinary Disorders, 327
Richard F. Randle

70 Ulcerative Posthitis, 328
Meredyth L. Jones

71 Bovine Enzootic Hematuria, 330
Matt D. Miesner
Section VIII
Genital Surgery—Male
Dwight Wolfe

73 Diagnosis and Management of Juvenile Anomalies of the Penis and Prepuce, 340
Dwight Wolfe and Soren P. Rodning

74 Diagnosis and Management of Penile Deviations, 342
Dwight Wolfe and Soren P. Rodning

75 Diagnosis and Management of Injuries to the Penis and Prepuce of Bulls, 345
Herris S. Maxwell and Misty A. Edmondson

76 Diagnosis and Management of Inguinal Hernia in Bulls, 356
Dwight Wolfe and Soren P. Rodning

77 Diagnosis and Management of Conditions of the Scrotum and Testes, 360
Dwight Wolfe and Robyn Wilborn

78 Preparation of Teaser Bulls, Rams, and Bucks, 364
Dwight Wolfe, Robert H. Whitlock, and Brian K. Whitlock

Section IX
Genital Surgery—Female
David E. Anderson

79 Bovine Cesarean Sections: Risk Factors and Outcomes, 372
Kenneth D. Newman

80 Vaginal and Uterine Prolapse, 382
Matt D. Miesner and David E. Anderson

81 Umbilical Surgery in Calves, 391
D. Michael Rings and David E. Anderson

82 Diagnosis and Management of Teat Injury, 398
Sylvain Nichols

83 Laparoscopy in Large Animal Surgery, 406
Kenneth D. Newman

Section X
Ophthalmic Examination Techniques
Harriet J. Davidson

84 Ophthalmic Examination Techniques for Production Animals, 416
Harriet J. Davidson

85 Selected Eye Diseases of Cattle, 421
Harriet J. Davidson and J. Phillip Pickett

86 Selected Eye Diseases of Sheep and Goats, 427
Harriet J. Davidson and J. Phillip Pickett

87 Ophthalmology of South American Camels: Llamas, Alpacas, Guanacos, and Vicuñas, 430
Juliet R. Gionfriddo and Deborah S. Friedman

88 Selected Eye Diseases of Swine, 435
Harriet J. Davidson

89 Food Animal Ocular Neoplasia, 437
Carmen M.H. Colitz

90 Neurogenic Vision Loss, 441
Paul E. Miller

91 Ophthalmic Therapeutics, 445
Harriet J. Davidson

92 Ocular Surgery: Enucleation in Cattle, 449
Kara Schulz

Section XI
Pharmacology and Therapeutics
Virginia R. Fajt

93 Ethical Responsibilities of Bovine Veterinarians in Selecting, Prescribing, and Using Therapeutic Drugs, 454
M. Gatz Riddell, Jr.

94 Ethical Responsibilities of Small Ruminant Veterinarians in Selecting and Using Therapeutics, 457
Joan S. Bowen and Joe Snyder

95 Practical Pharmacokinetics for the Food Animal Practitioner, 460
Ronette Gehring

96 FARAD and Related Drug Regulations, 468
Geoffrey Smith

97 Anthelmintic Treatment in the Era of Resistance, 470
Ray M. Kaplan

98 Antimicrobial Resistance in Human Pathogens and the Use of Antimicrobials in Food Animals: Challenges in Food Animal Veterinary Practice, 479
Bo Norby

99 Evidence-Based Veterinary Medicine: Therapeutic Considerations, 489
Robert L. Larson and Virginia R. Fajt

100 Therapeutic Options in Organic Livestock Medicine, 494
Hubert J. Karreman

101 Decision Making in Mastitis Therapy, 502
Sarah A. Wagner and Ronald J. Erskine

102 Respiratory Disease Treatment Considerations in Feedyards, 509
Dee Griffin

103 Antibiotic Treatment of Diarrhea in Preweaned Calves, 520
Joachim F. Berchtold and Peter D. Constable

104 Fluid Therapy, Transfusion, and Shock Therapy, 526
Allen J. Roussel, Jr., and Christine B. Navarre
Section XII
Chemical Restraint, Anesthesia, and Pain Management

Eric J. Abrahamsen

106 Chemical Restraint in Ruminants, 544
Eric J. Abrahamsen

107 Ruminant Field Anesthesia, 552
Eric J. Abrahamsen

108 Inhalation Anesthesia in Ruminants, 559
Eric J. Abrahamsen

109 Managing Severe Pain in Ruminants, 570
Eric J. Abrahamsen

Section XIII
Cow-Calf Production Medicine

Brad J. White

110 Marketing Beef Cow-Calf Production Medicine Programs in Private Practice, 576
W. Mark Hilton

111 Economic Analysis Techniques for the Cow-Calf Practitioner, 581
Thomas R. Kasari

112 Cow-Calf Operation Beef Quality Assurance, 587
Dee Griffin

113 Biosecurity for Cow-Calf Enterprises, 594
Mike Sanderson

114 Management of Neonatal Diarrhea in Cow-Calf Herds, 599
David R. Smith

115 Calf Preweaning Immunity and Impact on Vaccine Schedules, 603
James A. Roth

116 Beef Heifer Development, 605
Robert L. Larson

117 Investigation of Abortions and Fetal Loss in the Beef Herd, 613
William Dee Whittier

118 Addressing High Dystocia Incidence in Cow-Calf Herds, 618
Meredith L. Jones and Robert L. Larson

119 Carcass Ultrasound Uses in Beef Cattle Production Settings, 623
Shelie Laflin

Section XIV
Feedlot Production Medicine

Daniel U. Thomson

120 Preconditioned Calves in the Feedyard, 628
Brad J. White and Robert L. Larson

121 Low-Stress Livestock Handling, 632
Tom Noffsinger and Lynn Locatelli

122 Biosecurity for Feedlot Enterprises, 633
Mike Sanderson

123 Use of Statistical Process Control in Feedlot Practice, 637
Robert L. Larson and Brad J. White

124 Growth Promotants for Beef Production: Anabolic Steroids: Performance Responses and Mode of Action, 643
Bradley J. Johnson and Christopher D. Reinhardt

125 Feedlot Vaccination Protocols, 652
Janey L. Gordon and Daniel U. Thomson

126 An Economic Risk Assessment Model for Management of Pregnant Feeder Heifers, 659
Marilyn J. Corbin and Laura L. Hungerford

127 Investigating Lameness Outbreaks in Feedlot Cattle, 669
Jason Osterstock

128 Investigating Feedlot Respiratory Disease Outbreaks, 673
Larry C. Hollis

129 Feedlot Therapeutic Protocols, 676
Michael D. Apley

130 Feedlot Hospital Management, 678
Daniel U. Thomson

131 No Loose Parts Necropsy Procedure for the Feedyard, 682
Dee Griffin