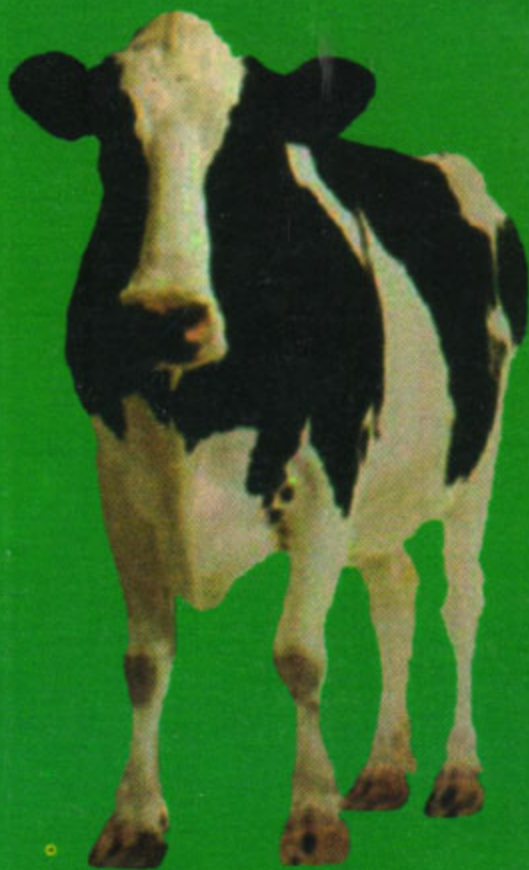


VETERINARY RADIOLOGY

Basic Principles & Radiographic Positioning

Edited by

A.P. Singh / Jit Singh



VETERINARY RADIOLOGY

Basic Principles and Radiographic Positioning

Edited by

A.P. SINGH

MVSc, PhD

JIT SINGH

MVSc, PhD

Department of Surgery and Radiology,

College of Veterinary Sciences,

C.C.S. Haryana Agricultural University, Hisar.

CONSULTANT EDITOR : KULDIP SINGH, MVSc, PhD

ILLUSTRATIONS : ASHOK KUMAR, MVSc

PHOTOGRAPHY : JASPAL SINGH



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delhi@cbspd.com, cbspubs@airtelmail.in • www.cbspd.com
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Corporate Office: 204 FIE, Industrial Area, Patparganj, Delhi - 110 092
Ph: 49344934 • Fax: 011-49344935
E-mail: publishing@cbspd.com • publicity@cbspd.com

Branches:

- **Bengaluru:** 2975, 17th Cross, K.R. Road, Bansankari 2nd Stage, Bengaluru - 70 • Ph: +91-80-26771678/79 • Fax: +91-80-26771680
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- **Chennai:** No. 7, Subbaraya Street, Shenoy Nagar, Chennai - 600030
Ph: +91-44-26681266, 26680620 • Fax: +91-44-42032115
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- **Kochi:** Ashana House, 39/1904, A.M. Thomas Road, Valanjambalam, Ernakulum, Kochi • Ph: +91-484-4059061-65
Fax: +91-484-4059065 • E-mail: cochin@cbspd.com
- **Kolkata:** 6-B, Ground Floor, Rameshwar Shaw Road, Kolkata - 700014
Ph: +91-33-22891126/7/8 • E-mail: kolkata@cbspd.com
- **Mumbai:** 83-C, Dr. E. Moses Road, Worli, Mumbai - 400018
Ph: +91-9833017933, 022-24902340/41 • E-mail: mumbai@cbspd.com
- **Pune:** Bhuruk Prestige, Sr. No. 52/12/2+1+3/2, Narhe, Haveli (Near Katraj-Dehu Road Bypass), Pune - 411041
Ph: +91-20-64704058/59, 32342277 • E-mail: pune@cbspd.com

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*This Book
is
Dedicated
to
The Memory of*



Late Dr. A.K. Bhargava

Formerly Associate Professor of Radiology, College of Veterinary Sciences, Haryana Agricultural University, Hisar; Professor, Division of Experimental Medicine and Surgery, Indian Veterinary Research Institute, Izatnagar.

*For
Promoting the Cause of Veterinary Radiology in India*

FOREWORD

It gives me immense pleasure to write foreword of a book compiled by my own former students. It is more so because it has been developed at a centre which I myself nursed from its infancy to adulthood. I clearly remember those days when as Professor and Head of the Department of Surgery and Radiology of Haryana Agricultural University, Hisar, I was able to install in the department a 500 mA ceiling suspension X-ray machine in 1972, first of its kind in a veterinary institute in India. The installation of this machine revolutionised large animal practice in the region. The event was a major contributing factor for the development of veterinary radiology in India as others followed suit and radiology in real sense was introduced for research and clinical applications. We in India have marched ahead in veterinary science research but are still struggling to provide primary radiological facilities in the field hospitals. Nevertheless awareness is emerging and many states have introduced the facilities at district headquarters as more and more polyclinics are being established.

Availability of sufficient financial resources and standard textbooks within easy reach have been two important limiting factors for the growth of veterinary science in developing countries. It is high time that need to develop textbooks which suit our own requirements and resources is fully understood. It was with this objective that "Ruminant Surgery" was prepared. The experiment proved a success considering the response that book evoked across the country within a few months of its publication. The compilation of this book on veterinary radiology has thus been on an appropriate time.

This book deals with basic principles, contrast techniques and radiographic positioning. Modern radiology can not be developed or maintained at its present position unless basic principles are fully understood, a subject often given second priority. The editorial of The Veterinary Record, November 30, 1935, Stated, "Success in veterinary radiology is not obtainable by merely purchasing one of the many X-ray installations He who employs the apparatus must possess a sound knowledge of X-ray physics, anatomy, pathology and perhaps above all, long experience in the interpretation of X-ray films. Without these qualifications the results obtained are unlikely to enhance the reputation of the would be radiologist." How appropriate are these lines to highlight the importance of understanding the basic principles and to ultimately develop insight for radiographic interpretation.

The authors have presented concise information in simple language amply supported by illustrations, photographs and X-ray plates. The approach should make it easy for the students and clinicians to understand the subject. I am sure undergraduate students of veterinary colleges, post-graduate students, clinicians and teachers will find this book a source of useful information. It should also be of immense value to the radiographers employed in veterinary radiological services and to those who intend to establish new radiological units.

I congratulate the editors and contributors for this tremendous job despite all the odds. Only those who undertake to compile such specialised books in our circumstances can really understand the handicaps involved. All the participants, especially the editors, thus deserve appreciation for a job well done.

R.P.S. TYAGI

Vice-Chancellor,
Himachal Pradesh Krishi Vishwavidalya
Palampur, Himachal Pradesh.

PREFACE

Our basic aim in compiling this textbook is to provide relevant information in a simple and practical style to the veterinary science students and practising veterinarians of the developing countries. There is now an increasing awareness about the importance of radiology as a diagnostic aid even in ruminant practice. Many states of India have started equipping their field veterinary hospitals, especially polyclinics, with modern X-ray machines. Thus veterinary radiology is no more limited to the four walls of the teaching institutes. In order to establish a radiology unit and to obtain quality radiographs, it is essential that basic principles are well understood. There are several excellent books on radiological physics and basic principles but are exhaustive as well as expensive. Most of these books are designed to meet the requirements of medical radiology. Therefore, there was a need to project concise information which is easy to comprehend and is available in an economical edition. Moreover, radiographic positioning protocols for ruminants have not been described in available books of veterinary radiology. This book is made with these objectives in view.

Contributors of this book, though experienced teachers and clinicians, had no formal training in radiological physics and so errors are inevitable. We do not claim any originality as far as basic principles are concerned since a variety of literature was consulted to compile the information. However, every attempt has been made to present the information in a simple way so that matter does not appear to be difficult to understand by an average undergraduate student. A number of illustrations and photographs have been included to make the text meaningful. Major material included in contrast techniques and radiographic positioning is original and produced within the scope of radiographic facilities available. Any material used with permission of various sources has been specified under the figures.

We hope that information provided in this book would enable the students and clinicians to gain a working knowledge of the basic principles of radiology, to establish a radiology unit and to obtain a quality radiograph. We also hope that information provided will be useful to radiographers working in veterinary radiological services who are usually trained in medical institutes in the absence of separate animal health technicians training programmes in most third world countries.

Considering that computers are fast entering day to day life and that these play an important role in a radiology section, a chapter on computers and radiology, incorporating basic information, has also been included. Techniques of alternate imaging described in chapter 9 are hardly used at this stage, except for fluoroscopy, in veterinary practice in developing countries. However, a veterinarian can not justify his training if he is not aware of even basic principles of such techniques which will certainly be used in practice in near future.

We also hope that information contained in this book would help in implementing a uniform syllabus in veterinary radiology teaching across the country for which Veterinary Council of India is emphasising. Wherever appropriate, selected questions have been listed at the end of chapters to help a clinician in testing his acquired knowledge and a student in preparing for an examination.

It was not easy for us to compile this book as we had no finances at our disposal and there were many additional constraints. We do hope that the readers will understand our limitations. Duplication of material was inevitable at a few places in order to maintain clarity in the text. We request the readers to send us their valuable suggestions for improving the book in future.

A.P. SINGH
JIT SINGH

ACKNOWLEDGEMENTS

It was not easy for us to compile this book on basic principles of radiology and radiographic positioning. There were times when we were not even sure of its reality. Nevertheless task could be completed because of continued support of many persons. We thank them all from our heart.

We are grateful to various publishers of standard works and editors of journals who allowed reproduction of illustrations and photographs. Publishers are : W.B. Saunders Co, Philadelphia; Iowa State University Press, Ames; Lea and Febiger, Philadelphia; The C.V. Mosby Co Saint Louis; Kluwer Academic Publishers, Dordrecht, Netherland and American Veterinary Publications. Journals include : Veterinary Radiology and Ultrasound, The Journal of American Veterinary Medical Association, Veterinary Medicine and Modern Veterinary Practice.

We thank Mr. Uri Bargai of Koret University, Israel and Dr. J.N. Kornegay of North Carolina State University, Raleigh, U.S.A., for providing material for inclusion in this book. We also thank M/S Siemens India Pvt Ltd to allow reproduction of photographs of their products.

The material used with permission/courtesy is specified in the legends to figures. But for this support, the contents of this book would have remained incomplete.

It is indeed an honour that foreword of this book has been written by an eminent personality of the profession, Dr. R.P.S. Tyagi, our mentor and guide. His contributions to the veterinary profession in India, especially in the discipline of surgery and radiology, are well known. We are grateful to him for sparing his valuable time to go through the contents of this book.

We thank the consultant editor, contributors, Dr. Ashok Kumar and Mr. Jaspal Singh for meeting the deadlines at short notices and for all the help and cooperation. We also thank postgraduate students of our department for the ever ready help. We gratefully acknowledge the help of Mr. D.P. Mangal, artist, in designing the cover of the book and the assistance provided by supporting staff of the department, especially Mr. Mohinder Kumar, Mr. Subhash, Mr. R.D. Sharma, Mr. Rati Ram, Mr. Mahavir and Mr. Parmod during photographic work.

"There is always a lady behind a successful man". We do not claim success but ladies were certainly standing solidly behind us. But for the moral support and cooperation of Mrs Veena A.P. Singh and Mrs. Pamila Jit Singh, this work would not have been completed. We thank Dr. Sudhir Sharma for the help in compiling the subject index. We are grateful to Mr. Pankaj Kalra of Creative Graphics and his staff for a job well done i.e. laser type setting of the manuscript. Last but not the least, we thank C.B.S. Publishers, especially Mr. Satish Jain and Mr. Vinod Jain, for bringing out this publication. Their warming smiles have always been cheering.

A.P. SINGH
JIT SINGH

CONTRIBUTORS

- Ashok Kumar, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, H.A.U. Hisar, Haryana.
- A.P. Bhokre, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, M.A.U. Parbhani, Maharashtra.
- A.P. Singh, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, H.A.U. Hisar, Haryana.
- B.A. Moulvi, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, Sher-e-Kashmir University of Agricultural Sciences and Technology, Shuhma, Alusteng, J & K.
- B.M. Jani, MVSc, PhD, Hospital Superintendent, Veterinary College, Anand, Gujarat.
- Bharat Singh, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Mathura, U.P.
- D.B. Patil, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, Veterinary College, Anand, Gujarat.
- D. Krishnamurthy, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, H.A.U. Hisar, Haryana.
- D.M. Makhdoomi, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, Sher-e-Kashmir University of Agricultural Sciences and Technology, Shuhama, Alusteng, J & K.
- G.C. Georgie, MVSc, PhD, Professor, Department of Animal Production Physiology, H.A.U., Hisar, Haryana.
- Gajraj Singh, MVSc, PhD, Senior Scientist, Division of Experimental Surgery, Indian Veterinary Research Institute, Izatnager, U.P.
- Harpal Singh, MVSc, PhD, Dean Postgraduate Studies, G.B. Pant University of Agriculture and Technology, Pantnagar, U.P.
- I.S. Chandna, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, H.A.U., Hisar, Haryana.
- J.R. Jindal, BA, DMR, Senior Radiographer, Department of Veterinary Surgery and Radiology, H.A.U., Hisar, Haryana.
- Jit Singh, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, H.A.U., Hisar, Haryana.
- K.I. Singh, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, P.A.U. Ludhiana, Punjab.
- K.K. Mirakhr, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, P.A.U. Ludhiana, Punjab.
- Kuldip Singh, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, H.A.U. Hisar, Haryana.
- Mohinder Singh, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, H.P.K.V, Palampur, Himachal Pradesh.
- N.R. Purohit, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Bikaner, Rajasthan.
- N.S. Saini, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, P.A.U. Ludhiana, Punjab.

- P.K. Peshin, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, H.A.U, Hisar, Haryana.
- Prem Singh, MVSc, Assistant Professor, Department of Veterinary Surgery and Radiology, H.A.U. Hisar, Haryana.
- R.R. Parsania, MVSc, PhD, Professor, Department of Veterinary Surgery and Radiology, Veterinary College, Anand, Gujarat.
- Rishi Tayal, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, H.A.U, Hisar, Haryana.
- S.K. Chawla, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, H.A.U, Hisar, Haryana.
- S.M. Behl, MVSc, Assistant Professor, Department of Veterinary Clinic, H.A.U, Hisar, Haryana.
- Sukhbir Singh, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, H.A.U, Hisar, Haryana.
- S. Thilgar, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, Madras Veterinary College, Madras, Tamil Nadu.
- T.K. Gahlot, MVSc, PhD, Assistant Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Bikaner, Rajasthan.
- Trilok Nanda, MVSc, FRVCS (Sweden), Assistant Professor, Department of Veterinary Gynaecology and Obstetrics, H.A.U, Hisar.
- V.K. Sobti, MVSc, PhD, Associate Professor, Department of Veterinary Surgery and Radiology, P.A.U, Ludhiana, Punjab.

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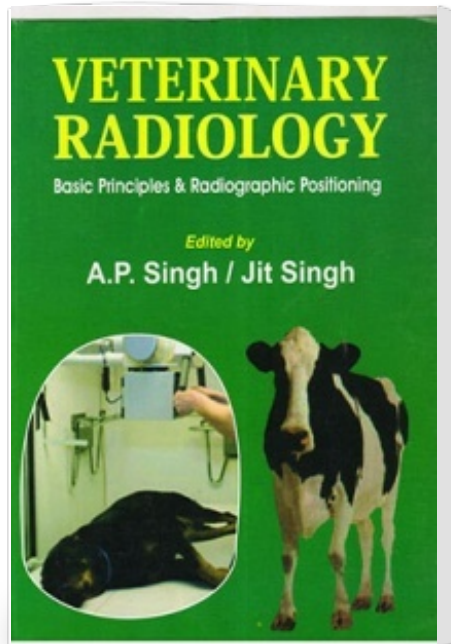
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