

A Text Book of

**GENERAL AND SYSTEMIC
VETERINARY MEDICINE**

(As per MSVE Regulations 2016 of VCI)

A Text Book of

GENERAL AND SYSTEMIC VETERINARY MEDICINE

(As per MSVE Regulations 2016 of VCI)

Dr. Kalyan Sarma, M.V.Sc., Ph.D.

Professor

*Department of Veterinary Medicine, College of Veterinary Sciences & Animal Husbandry
Central Agricultural University, Selesih, Aizawl-796015, Mizoram, India*

Dr. Chethan G.E., M.V.Sc., Ph.D.

Assistant Professor

*Department of Veterinary Medicine, College of Veterinary Sciences & Animal Husbandry
Central Agricultural University, Selesih, Aizawl-796015, Mizoram, India*

Dr. Mritunjay Kumar, M.V.Sc., Ph.D.

Assistant Professor

*TVCC (Vety Medicine), College of Veterinary Science & Animal Husbandry
R.K. Nagar, Agartala-799008, Tripura (West), India*

Dr. Gunjan Das, M.V.Sc, Ph.D.

Professor & Head

*Department of Veterinary Medicine, College of Veterinary Sciences & Animal Husbandry
Central Agricultural University, Jalukie, Peren-797110, Nagaland, India*

Dr. M. Sarvanan, M.V.Sc., Ph.D.

Assistant Professor

*Teaching Veterinary Clinical Complex, Veterinary College and Research Institute
Orathanadu, Thanjavur-614625, Tamil Nadu, India*

Dr. J.B. Rajesh, M.V.Sc., Ph.D

Assistant Professor

*Department of Veterinary Medicine, College of Veterinary Sciences & Animal Husbandry
Central Agricultural University, Selesih, Aizawl-796015, Mizoram, India*

Dr. Neeraj Thakur, M. V. Sc., Ph.D

Assistant Professor

*Department of Teaching Veterinary Clinical Complex
Faculty of Veterinary and Animal Sciences, Rajiv Gandhi South Campus, Banaras Hindu University Barkachha,
Mirzapur-231001, Uttar Pradesh, India*



**NEW DELHI PUBLISHERS
NEW DELHI, KOLKATA**

“A Text Book of General and Systemic Veterinary Medicine” by Sarma *et al.*, New Delhi Publishers, New Delhi, India

© Authors

First published: 2023

ISBN: 978-93-93878-11-3

All rights reserved. No part of this book may be reproduced stored in a retrieval system or transmitted, by any means, electronic mechanical, photocopying, recording, or otherwise without written permission from the publisher.



NEW DELHI PUBLISHERS

Head Office: 90, Sainik Vihar, Mohan Garden, New Delhi – 110 059

Corporate Office: 7/28, Room No.-208, Vardaan House, Mahavir Lane,
Ansari Road, Daryaganj, New Delhi-110002

Branch Office: 216, Flat-GC, Green Park, Nerendrapur, Kolkata - 700103

Tel: 011-23256188, 9971676330

E-Mail: ndpublishers@rediffmail.com/[gmail.com](mailto:ndpublishers@gmail.com)

Website: www.ndpublisher.in

PREFACE

With rapid advancement and growing knowledge in Veterinary Sciences, it has become necessary to update the existing knowledge and incorporate the new advances in books to provide the readers with new relevant information. The present text book of General and Systemic Veterinary Medicine contains the material in a concise form and it has been compiled by keeping revised curriculum of Veterinary Council of India (VCI) and Minimum Standards of Veterinary Education (MSVE), 2016 guidelines in sight, so that a uniform syllabus can be followed in various veterinary colleges across the country.

This book thoroughly covers all the topics of General and Systemic Veterinary Medicine (Unit I and II) which will be of great use to veterinary undergraduate students of BVSc & AH. In the present text book, many topics are supported with relevant photographs which will help in better understanding of the topics. The topics are written in a concise manner mainly focusing on undergraduate students. Graphical and schematic presentations of pathogenesis of the various diseases have been provided. It will also be helpful for practicing field veterinarians in better understanding the clinical diseases of animals.

This textbook has been written following a thorough review of publications from recognized national and international journals, as well as mainstream Veterinary Sciences textbooks. The information from authentic websites is also incorporated. The contributors of those publications, textbooks, and websites are gratefully acknowledged by the authors.

The authors would like to express their gratitude to 'New Delhi Publishers' for their constant support and assistance in producing a high-quality, uniformly printed book.

This textbook will be a useful asset to the fourth year BVSc & AH students as well as field veterinarians. Wishing a meaningful and helpful study, we present this textbook.

*Kalyan Sarma, Chethan G.E., Mritunjay Kumar,
Gunjan Das, M. Sarvanan, J.B. Rajesh and Neeraj Thakur*

About the Authors



Dr. Kalyan Sarma has earned B.V.Sc. & A.H. degree from Assam Agricultural University, Jorhat. He has completed his M.V.Sc. degree with distinction in the year 1996 from Assam Agricultural University, Jorhat, in the discipline of Veterinary Medicine and Ph.D. degree from the ICAR-IVRI, Izatnagar, Bareilly, Uttar Pradesh in the year 2012. He has received various awards including, the Best Teacher award, Outstanding Scientist Award, ISVM Appreciation Award and Overseas Associate Fellowship, DBT. He has visited Koret School of Veterinary Medicine, Hebrew University, Rehovot, Jerusalem, Israel for three months for research purposes. He has attended many national and international seminars, symposiums and refresher training courses. He has published five books, over 150 research papers in various international and national journals, three manuals and 37 popular articles. He has experience of over 21 years in the field of Veterinary medicine (Teaching, Research and Extension), has guided 2 Ph. D. students, 10 M.V.Sc Students as Major advisor (Veterinary Clinical Medicine) and acted as Co-guide for twenty M.V.Sc. Students. He has handled one DBT-funded project as PI and associated with 3 DBT-funded projects as Co-PI. He has also completed two Intramural research projects as PI and six IRPs as Co-PI. At present, he is working as a Professor in the Department of Veterinary Medicine and is actively involved in teaching, research and extension activities at the College of Veterinary Sciences and Animal husbandry, Central Agricultural University, Selesih, Aizawl, Mizoram, India.



Dr. Chethan G.E. completed his B.V.Sc & A.H. from Veterinary College, Hebbal, Bengaluru, KVAFSU, Bidar, Karnataka, in 2014. He earned his M.V.Sc and Ph.D. in Veterinary Medicine from the ICAR-IVRI, Izatnagar, Bareilly, Uttar Pradesh. He has cleared ICAR-JRF, ICAR-SRF, ICAR-NET and UGC-NET exams. He is working as an Assistant Professor at the Department of Veterinary Medicine, CVSc & AH, CAU, Selesih, Aizawl, Mizoram, for 4 years. He has received many awards for presenting research papers at national and international symposiums. He has published 60 research articles, case reports and popular articles in National and International Journals. He has authored 4 books and 5 manuals. He has life membership of Veterinary Council of India (VCI) and 04 national scientific societies. He is having a research experience of 8 years including M.V.Sc and Ph.D. and teaching experience of 4 years.



Dr. Mritunjay Kumar has completed B.V.Sc & A.H. degree from Veterinary College (KVAFSU), Bidar in the year 2005, M.V.Sc in Veterinary Medicine from Ranchi Veterinary College (BAU), Kanke in the year 2008 and Ph.D. in Veterinary Medicine from Indian Veterinary Research Institute, Izatnagar, in the year 2011. Dr Kumar commenced his professional career as Research Associate in the NICRA project at IVRI, Izatnagar and presently working as an Assistant Professor in the Department of Veterinary

Medicine, College of Veterinary Sciences & A.H., R.K. Nagar, Tripura (W), Tripura. Dr Kumar secured ICAR-JRF for M.V.Sc. (Veterinary Medicine), ICAR-SRF for PhD (Veterinary Medicine), ASRB-NET, Merit Scholarship for B.V.Sc. & A.H., Best Student Award (Bronze Medal) for PhD in IVRI and various professional societies awards. He handled one extra-mural project as Principal Investigator funded by SERB, Department of Science and Technology, Government of India and one clinical trial funded by Ayurvet India, Solan. He has published the book “Veterinary Medicine (Livestock and poultry diseases)” in the Hindi language as co-author. Besides he has published more than 60 research articles, clinical articles and popular articles in various reputed national and international journals. He is a member of many professional societies and was elected as a member of the executive council (North East Regional Secretary) of the Indian Society of Veterinary Medicine in the year 2018. Dr. Mritunjay Kumar has currently 198-Google Scholar Citations, 7-h index and 135-Research Gate Citations.



Dr. Gunjan Das is graduated from the College of Veterinary Science and A.H, Khanapara, Guwahati in 1999 and later on obtained an M.V.Sc degree in Veterinary Medicine in 2002 from West Bengal University of Animal & Fishery Sciences, Kolkata and was awarded Ph.D in 2007 from prestigious Indian Veterinary Research Institute. He worked as RA (ICMR) in the CDC Atlanta project before joining Ph.D programme for a brief period. He served as Assistant Professor in the Dept. of Veterinary Preventive Medicine,

Faculty of Veterinary Sciences, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Shuhama, Srinagar for nearly 2 years (2004-2006) and then joined Central Agricultural University as Assistant Professor in the Department of Veterinary Clinical Medicine, College of Veterinary Sciences & Animal Husbandry, Central Agricultural University, Selesih, Aizawl, Mizoram (2006-2009). In October 2015, he was selected as a Professor and now he is working in the Department of Veterinary Clinical Medicine, College of Veterinary Sciences & Animal Husbandry, Central Agricultural University, Jaluki, Nagaland. He has experience of over 16 years in the field of Veterinary medicine (Teaching, Research and Extension), has guided

5 M.V.Sc Students as Major Advisor (Veterinary Clinical Medicine) and acted as Co-guide for sixteen M.V.Sc. Students. He has also guided two Ph.D. students as Co-guide. He has handled three DBT-funded project as PI and associated with 3 DBT-funded and one ICAR-funded projects as Co-PI. He has also completed two Intramural research project as PI and seven IRPs as Co-PI. Contributed in different fields of research in Veterinary Medicine and published more than 80 research papers in national and international peer reviewed journal. He has attended numerous National and international symposiums and conferences and presented papers.



Dr. Mani Saravanan is presently working as Assistant Professor at Veterinary Clinical Complex, Veterinary College and Research Institute, TANUVAS, Tamil Nadu, India since 2012. His area of specialization is Veterinary Internal Medicine. He did graduation and post-graduation from Tamil Nadu Veterinary and Animal Sciences University, Chennai. He has completed his Ph.D. programme at Indian Veterinary Research Institute, Izatnagar, India in 2012. He has research experience

in Veterinary Gastroenterology and Hepatology. He is expertise in endoscopy and abdominal ultrasound of farm and pet animal practice. He has published national and international level publications viz., 32 research papers, 42 clinical articles, 5 review articles, 5 book chapters (4 in Tamil national level and one English international) and popular articles. He has played the role of Editorial board member and Reviewer in reputed Journals. He has life membership of various scientific societies viz., Tamil Nadu State Veterinary Council, Veterinary Council of India (VCI), Indian Society for Veterinary Medicine (ISVM), Society for Community Mobilization for sustainable development, Indian Society for Advancement of Canine Practice (ISACP) and Agricultural Scientific Tamil Society.



Dr. J.B. Rajesh did his graduation and post-graduation from Kerala Agricultural University. He did his PhD (in Veterinary Medicine) from Indian Veterinary Research Institute (Izatnagar). He had also earned Post Graduate National Diploma (Biological Products) from IVRI and Animal Welfare course from TANUVAS in 2001. He is now working as an Assistant Professor in the College of Veterinary Sciences and Animal Husbandry (Central Agricultural University), Selesih, Aizawl, Mizoram since 2009. Besides teaching UG, PG and

Ph.D. students, he is involved in 12 research projects (including both intramural and externally funded). He has published 52 research articles in national or international journals, three books and 25 popular articles in different recognized magazines. He has received four awards from different agencies.



Dr. Neeraj Thakur completed her B.V.Sc & A.H. from the College of Veterinary and Animal Sciences, CSKHPKV, Palampur, Himachal Pradesh, in 2015. She has completed her M.V.Sc in Veterinary Medicine from ICAR-IVRI, Izatnagar, Bareilly, Uttar Pradesh and Ph.D. degree from G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. She has been awarded University Gold Medal, Brig. H.G. Bhandari Gold Medal and Himotkarsh Gold Medal for B.V.Sc & A.H., ICAR-JRF, ICAR-SRF and UGC-NET JRF fellowships. She is working as Assistant Professor

at the Department of Teaching Veterinary Clinical Complex, Faculty of Veterinary and Animal Sciences, Rajiv Gandhi South Campus, Banaras Hindu University, Barkachha, Mirzapur, Uttar Pradesh, for 3 years. She has presented many research papers at National and International Symposiums. She has published 30 research articles and case reports in National and International Journals. She has authored 1 book and 2 manuals. She has life membership of Veterinary Council of India (VCI) and 03 national scientific societies. She is having a research experience of 7 years including M.V.Sc and Ph.D. and teaching experience of 3 years.

Contents

<i>Preface</i>	<i>v</i>
<i>About the Authors</i>	<i>vi</i>
1. History of Veterinary Medicine	1
<i>Kalyan Sarma, Chethan G.E. and Neeraj Thakur</i>	
2. Concept of Disease	7
<i>Kalyan Sarma, Chethan G.E. and Neeraj Thakur</i>	
3. Concept of Diagnosis, Treatment and Prognosis	17
<i>Kalyan Sarma, Chethan G.E. and Neeraj Thakur</i>	
4. Estimates of Diseases, Patterns of Disease, Disease Monitoring and Surveillance, Herd Health and Quarantine	29
<i>Gunjan Das, Kalyan Sarma and Chethan G.E.</i>	
5. Hypothermia, Hyperthermia and Fever	55
<i>Kalyan Sarma, Chethan G.E. Neeraj Thakur and Gunjan Das</i>	
6. Septicemia and Viremia	75
<i>Kalyan Sarma, Chethan G.E. and Neeraj Thakur</i>	
7. Toxemia and Endotoxemia	81
<i>Kalyan Sarma, Chethan G.E. and Neeraj Thakur</i>	
8. Shock and their Management	89
<i>Kalyan Sarma and Gunjan Das</i>	
9. Fluid, Electrolyte and Acid-Base Imbalance	95
<i>Kalyan Sarma and Gunjan Das</i>	
10. Edema	103
<i>Kalyan Sarma and Mritunjay Kumar</i>	

11. Allergy and Anaphylaxis	113
<i>Kalyan Sarma and Mritunjay Kumar</i>	
12. Anaemia	123
<i>Kalyan Sarma and Mritunjoy Kumar</i>	
13. Common Clinical Poisoning	131
<i>Chethan G.E., Kalyan Sarma and Neeraj Thakur</i>	
14. Diseases of Digestive System	279
<i>Kalyan Sarma and Mritunjay Kumar</i>	
15. Diseases of Liver and Pancreas	363
<i>Kalyan Sarma and Mritunjay Kumar</i>	
16. Diseases of the Respiratory System	391
<i>Kalyan Sarma and M. Sarvanan</i>	
17. Diseases of Cardiovascular System	413
<i>M. Sarvanan and Kalyan Sarma</i>	
18. Diseases of Hematopoietic System	449
<i>Kalyan Sarma and M. Saravanan</i>	
19. Diseases of Urinary System	465
<i>Kalyan Sarma and M. Sarvanan</i>	
20. Diseases of Integumentary System	513
<i>Kalyan Sarma</i>	
21. Diseases of Ear	545
<i>J.B. Rajesh and Kalyan Sarma</i>	
22. Diseases of Eye	553
<i>Kalyan Sarma and J.B. Rajesh</i>	
23. Diseases of Musculoskeletal System	581
<i>Kalyan Sarma and J.B. Rajesh</i>	

24. Diseases of the Nervous System	597
<i>Kalyan Sarma</i>	
25. Emergency Medicine and Critical Care	623
<i>Kalyan Sarma</i>	
Bibliography	639
<i>Index</i>	649

