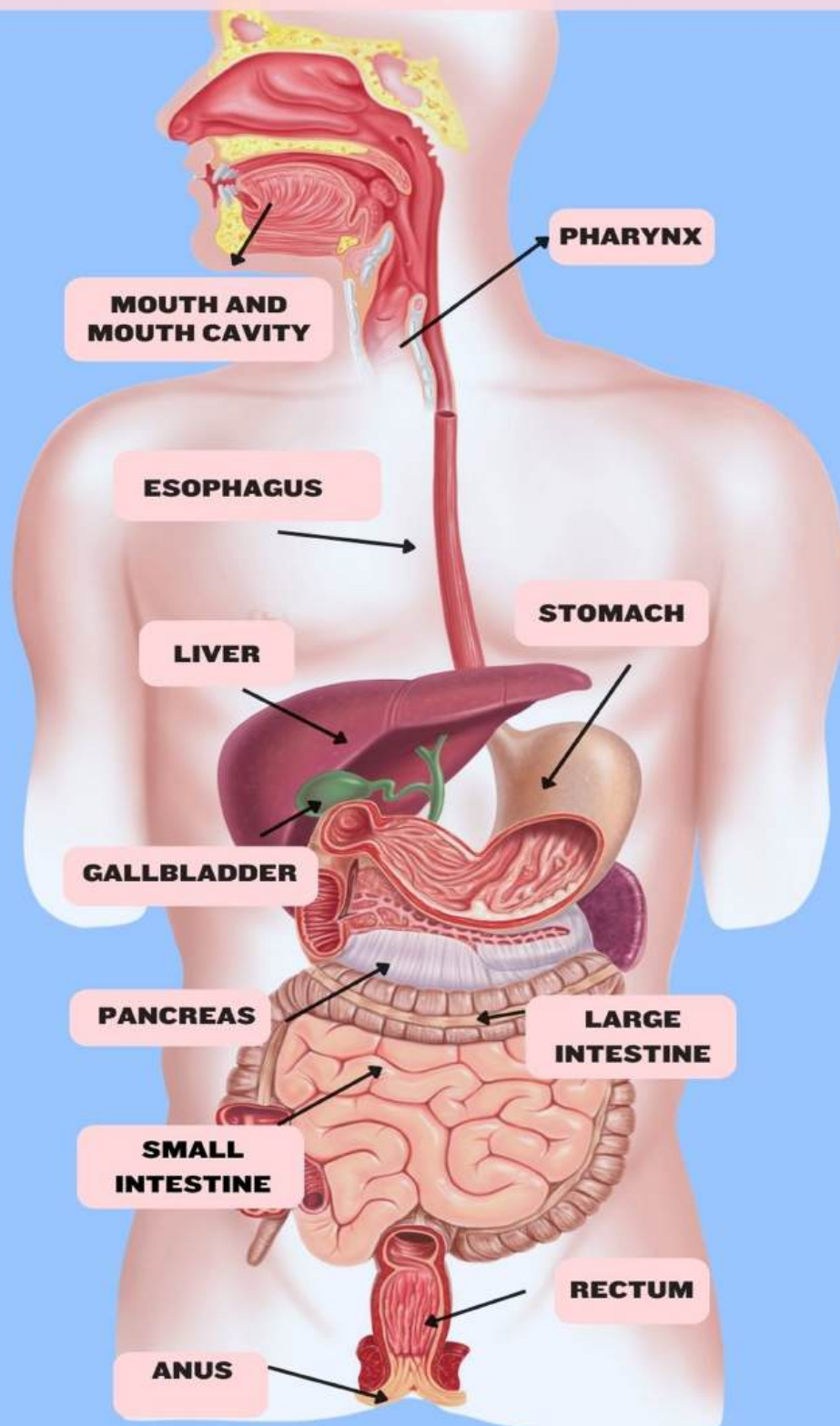


A TEXT BOOK ON **DIGESTIVE PHYSIOLOGY** WITH QUESTIONS AND ANSWERS



Dr. APK MAHAPATRA (PhD, AIIMS, NEW DELHI)



A TEXT BOOK ON DIGESTIVE PHYSIOLOGY WITH QUESTIONS AND ANSWERS

First Edition

Authors

Dr. Ambika Prasad K Mahapatra

Dr. Swagat Mohapatra

Dr. Nirupama Dalai

Dr. Smruti Ranjan Mishra



Title of the Book: A Text Book on Digestive Physiology with Questions and Answers

First Edition – 2025

Copyright 2025 © Authors

Dr. Ambika Prasad K Mahapatra, Associate Professor, Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry Ouat, Bhubaneswar, Odisha.

Dr. Swagat Mohapatra, Assistant Professor, Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneswar, Odisha.

Dr. Nirupama Dalai, Assistant Professor, Department of Veterinary Physiology, College of Veterinary Science & Animal Husbandry, OUAT, Bhubaneswar, Odisha.

Dr. Smruti Ranjan Mishra, Assistant Professor, Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry, Odisha.

No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owners.

Disclaimer

The authors are solely responsible for the contents published in this book. The publishers don't take any responsibility for the same in any manner. Errors, if any, are purely unintentional, and readers are requested to communicate such errors to the authors or publishers to avoid discrepancies in the future.

E-ISBN: 978-93-7020-904-6

MRP Rs. 220/-

Publisher, Printer & Distributor:

Selfypage Developers Pvt Ltd.,
Pushpagiri Complex,
Beside SBI Housing Board,
K.M. Road Chikkamagaluru, Karnataka.
Tel.: +91-8861518868
E-mail: info@iipbooks.com

IMPRINT: IIP Iterative International Publishers

For Sales Enquiries:

Contact: +91- 8861511583
E-mail: sales@iipbooks.com

Preface

First of all, we would like to express our gratitude to all the students and teachers of various medical colleges. Dental colleges, Veterinary College and colleges of physiotherapy, pharmacy, nursing and other allied health sciences all over India for their overwhelming support, acceptance, appreciation and valuable suggestions regarding our textbook titled Basics of Central Nervous System in 2025.

The trend of learning and teaching and the pattern of examination are changing from "long question-answer" to "short question-answer" not only in India but also all over the world because this enables the teachers and the examiners to cover wide area of subject. It is easier for students also to read and remember the answers in short form.

In view of all these facts and the feedbacks on our textbook received from students and our fellow teachers all over India, we have made an attempt to bring out a book on Viva Voce in Physiology. The special aspect of this book is that it is written in very simple language taking care for the poorest students even who can understand. Each and every aspect of digestive system in monogastric animals are put in such a way that it makes the students to become more enthusiasm to know what next. All the things are covered point wise so that even anyone can understand. Our aim is to provide a textbook which should be easy to understand and remember, recollect and represent it on black and white along with happily.

We will be very happy to receive opinions, comments and valuable suggestions on this book from students and our fellow teachers. This will enable us to improvise and revise it accordingly in the succeeding editions.

"Our motto is to be simple though it is difficult"

"Jhiva is Shiva"

"Things Written anywhere in the book are out of common sense though common sense is very un- common"

Chief Editor
Dr. Ambika Prasad K Mahapatra
PhD (AIIMS, New Delhi)

Acknowledgement

We sincerely acknowledge the help, support and encouragement provided by each and every member of the College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneswar-751003, ODISHA in general and specifically The Department of Veterinary Physiology without whom it might have been possible.

Regards and respects are due worthy to our DEAN of the faculty as well as the Hon'ble Vice Chancellor of the University,

Family support can never be expressed

Finally, the Supreme Power or the GOD/ALLAH/Jesus..... are by default from the core of the heart are being acknowledged.

We are acknowledging the help and support of the publisher which is highly applicable.

Thanks to the Almighty.

Our motto is:

‘DEVELOP CUROCITYAS WELL AS CONFIDENCEAMONGST THE INTERSTED STUDENTS TO KNOW SOMETHING’.

“THE SHIVISJIV”.

“CELL IS NOT THE UNIT OF LIFENOR DOES LIFE HAVE ANY CELL”.

Chief–Editor

Dr. Ambika Prasad K Mahapatra
PhD (AIIMS, New Delhi)

Co-Authors

Dr. Swagat Mohapatra
PhD (OUAT, Odisha)

Dr. Nirupama Dalai
PhD (WBUAFS, West Bengal)

Dr. Smruti Ranjan Mishra
PhD (IVRI, UP)

Contents

Chapter 1	Mouth and Salivary Glands	1-12
Chapter 2	Liver and Gallbladder	13-26
Chapter 3	Stomach	27-31
Chapter 4	Small Intestine	32-39
Chapter 5	Large Intestine	40-46
Chapter 6	Gastrointestinal Hormones	47-54
Chapter 7	Movements of Gastrointestinal Tract	55-69
Chapter 8	Digestion, Absorption and Metabolism of Carbohydrates	70-73
Chapter 9	Digestion, Absorption and Metabolism of Proteins	74-76
Chapter 10	Digestion, Absorption and Metabolism of Lipids	77-82
	Question and Answer	83-212

CHIEF-EDITOR



Dr. Ambika Prasad Khadanga Mahapatra, after finishing his PhD from AIIMS (New Delhi) in 2005, joined as an Assistant Professor in the Department of Veterinary Physiology in the College of Veterinary Science and A. H, Bhubaneswar-3 OUAT, ODISHA. He had been selected as an Associate Professor in 2012 (may). More than 30 research articles, 2 lab manuals, Young Scientist Award in Zhu Hai (China) in 2004 at the Asian Sleep Research Society conference. A Guided 8 M.V. Sc students till now and member of an advisory committee of 15 PG students so far. Fifteen day training in University of Missouri Kansas City (UMKC), USA on genetic study and its expression; including Fluorescent Activated Cell Sorting (FACS), also on in vivo study on transgenic animal, (mouse model).

Professor and Head of the Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry, OUAT, BHUBANESWAR - 751003, Odisha. After 15 years of service, I finally reached this position. I have guided more than 10 PG students out of them, many are faulty in different SAUs, including our college. Co-guided more than 20 M. V. SC. Students. I had an opportunity to go to the USA, University of Missouri Kansas City, where I was trained on transgenic animals and also exposed to find out regarding Fluorescent Activated Cell Sorting (FACS) as well as gene expression and all the techniques of molecular Physiology. I was a resource person at the international conference held in Sydney and was awarded for a significant contribution to science. Presented a paper having the title 'The cell is not a unit of life, no life has any cell'. I got the best oral presentation on 'Music enhances the milk yield'. I was invited as subject expert for Asst. Professor selection in Imphal.

In my own opinion patience, honesty and punctuality are the three things that can give grace of God.

Email id : apkmahapatra@ouat.ac.in

phone: 94383 02815

AUTHORS



Dr. Swagat Mohapatra, Assistant Professor in the Department of Veterinary Physiology, C.V. Sc. and A.H., OUAT, Bhubaneswar, has more than twelve years of his career dedicated towards teaching and research. He has published 55 research papers, one book and three book chapters with ISBNs. He has pursued training at The University of Melbourne, Australia under IDP-NAHEP. He is the Principal Investigator of one DST, an Odisha-funded project implemented in collaboration with The University of Melbourne, Australia. He is working as co-Principal Investigator on three other research projects at OUAT. He has received five academic awards at National Level for Best Research Paper Presentation in 'Oral' and 'Poster' modes.

Email id : swagatmohapatra@ouat.ac.in

phone: 9438566888



Dr. Nirupama Dalai served for over 10 years as an Assistant Professor in the Department of Veterinary Physiology, College of Veterinary Science & Animal Husbandry, OUAT, Bhubaneswar, Odisha. She holds her B.V. Sc. & AH degree in the year 2008 from C.V. Sc. & A.H., OUAT, Bhubaneswar, Odisha and completed M.V. Sc. in the year 2011 in Veterinary Physiology from W.B.U.A.F.S. Belgachia, Kolkata. She has a specialization in Animal Reproductive Physiology and has published a lot of research and review articles in prestigious National and International journals and many popular articles on various topics. She has attended various National and International seminars, conferences and published abstracts. She is a life member of several scientific societies. Till date, she has guided 3 M.V. Sc students as major advisor and 4 students as minor advisor. She has been awarded the Inspiring Lady Veterinarian Award 2021, the Rajbanshi Devi Memorial Award 2021, Dr. V. Kurien Award 2021 and Dr. R. K. Goel Memorial Excellence Award 2025 by Pashudhan Praharee.

Email id : nirupamad@ouat.ac.in

phone: 8249810575



Dr. Smruti Ranjan Mishra is currently working as Assistant Professor in the Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry, Odisha University of Agriculture and Technology, Bhubaneswar, since 2015 and has richly contributed to excellence in teaching and research. He completed a Ph.D. in Veterinary Physiology from ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, U.P., India in 2015. He qualified for the ICAR-NET Examination in 2012. He has guided 05 M.V. Sc scholars as chair of an advisory committee till date. He has also co-guided 04 Ph.D. scholars and 30 M.V. Sc scholars as member of an advisory committee till date. He has handled 03 national projects as Co-Principal Investigator. He has published more than 40 research papers in various journals of national and international repute. He has authored one book, several book chapters, review articles, and popular articles.

Email id : srmishra@ouat.ac.in

phone: 8763213389



Selfypage Developers Pvt Ltd

E- ISBN: 978-93-7020-904-6



MRP Rs. 220/-