

Poultry Science and Practice

A Textbook

The book consists of two parts :

PART I Avian Production Management and

PART II Commercial Poultry Production and Hatchery Management.

All the fundamental and practical points in poultry production, including chicken, duck, quail, turkey, guinea fowl, emu and goose have been given in this book.

It is primarily written for BVSc & AH students of veterinary colleges/universities all over India, as per the revised syllabus framed by the Veterinary Council of India. A large number of objective as well as subjective questions given at the end of each chapter is an additional attraction of the book as the students can prepare themselves for the composite annual examination under VCI pattern.

Poultry drug index indicating commonly available medicines and vaccines will greatly help the budding veterinarians and poultry health workers. Veterinary and animal science students, veterinary practitioners and progressive animal farmers will find this book interesting, informative and invaluable.

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A Textbook

For the VCI Courses on

- Avian Production Management
- Commercial Poultry Production and Hatchery Management

Nilotpal Ghosh



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Poultry Science and Practice

A Textbook

as Per Revised VCI Syllabus for Veterinary Students

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to
Prof DN Maitra
my esteemed teacher

Aporna
my wife

Archisman
my son

Foreword

The poultry production in our country has witnessed significant progress over the years primarily due to research and development thrust of government and organised private sectors. Compared to the other livestock sectors, poultry production in India is more scientific, better organised and continuously progressing towards modernisation. At present India ranks third in egg production in the world after China and the USA, with the total annual egg production of about 66.45 billion and fifth in broiler production with 2.47 million tonnes of broiler meat. Currently, it is growing at the rate of 6 percent per annum in egg production and 12 percent per annum in broiler production. Here poultry production has emerged as an industry, and this sector of livestock industry is already employing in excess of 7 million persons in various activities and can generate a huge number of new jobs per year with the present growth rate. This sector alone contributes about 0.5 percent of the India's GDP and 10 percent of the livestock GDP, and it is becoming a significant contributor to the Indian economy. It may be mentioned here that China is the number 1 country in the world so far in egg and chicken production. However, in China, most of the poultry is in the form of backyard poultry or in unorganised sector which is not overdependent upon the imported germplasm. It is also true in case of Bangladesh and Vietnam where two-thirds of the total egg production comes from rural poultry, while in India, the situation is just the reverse. So in India, apart from expanding high input intensive poultry production system under organised sector, reorienting and strengthening of rural poultry can be an important tool for improving living standards, poverty alleviation and nutritional security of the people belonging to lower strata of the society.

Veterinary Council of India's "Minimum Standards of Veterinary Education—Degree Course (BVSc & AH) Regulations, 2008" rightly gave extra emphasis on poultry science education in undergraduate veterinary curricula by introducing two separate courses, viz. 'Avian Production Management' and 'Commercial Poultry Production and Hatchery Management'.

This book entitled *Poultry Science and Practice: A Textbook* written by Dr Nilotpal Ghosh is unique of its kind as it covers the entire syllabus of two courses framed by the VCI. The basics as well as all the applied aspects of poultry production, including fowl, duck, quail, turkey, Guinea fowl, emu and goose, have been nicely highlighted in the single volume. It is written in a simple language, and a large number of objective as well as subjective questions at the end of each chapter will help the students to prepare for their examinations. I hope because of its contents and style



of presentation, this book would become quite popular amongst students, teachers, animal husbandry extension personnel, progressive poultry keepers and persons working in the field of poultry husbandry. The efforts of the author deserve appreciation.

D. K. Bagchi

D.K. Bagchi

Ex-Vice Chancellor
Bidhan Chandra Krishi Viswavidyalaya
Mohanpur, Nadia, West Bengal

Preface

This book *Poultry Science and Practice: A Textbook* is actually composed of two parts, viz. Part I: Avian Production Management and Part II: Commercial Poultry Production and Hatchery Management.

This book has been prepared by strictly covering the revised syllabus of two courses (LPM-211 and LPM-221) for BVSc and AH students, framed by the Veterinary Council of India, the apex body for veterinary education in India. Such a type of VCI syllabus-oriented textbook is rarely available in India. The text material is presented in a simple and lucid language.

The information is up-to-date and given in concise form and in such a manner that the book can be used as a substitute for class notes. A large number of objective as well as subjective questions given at the end of each chapter is an additional attraction of the book, as the students can prepare themselves for the composite annual examination under VCI pattern.

For the use of this book in practical fields, all the relevant points in poultry production including chicken, duck, quail, turkey, Guinea fowl, emu and goose have been highlighted in this text. Besides, the poultry drug index indicating medicines and vaccines available in the market for maintenance of poultry health, helps a lot to the neovets and practising poultry specialists.

Who will be benefited?

This book is primarily meant for veterinary students of India. It will also help the concerned teachers/demonstrators of all veterinary colleges/universities in India for offering this course.

This book will also be useful for veterinarians, livestock development officers, animal husbandry extension personnel and progressive poultry farmers in India and other tropical countries.

Nilotpal Ghosh

Acknowledgments

It is my immense pleasure that this book has ultimately come to light. The information received from various sources is gratefully acknowledged. Bibliography has been given at the end of this book to give due credit to the authors. I extend my thanks to my teachers, relatives, friends and colleagues for their inspiration and motivation. My acknowledgment would be incomplete, if I do not mention the name of my reverend teachers Prof DN Maitra, Prof L Mandal and Prof G Choudhuri, without whose blessings and encouragement I could not have completed this work. I also convey my regards to my teachers Prof SC Majumdar, Prof SK Roy, Prof AK Samanta, Prof S Pan and Prof R Samanta, who nurtured me during my masters degree study and research.

My sincere thanks are due to Mr SK Jain, Mr YN Arjuna and their team at CBS Publishers & Distributors, New Delhi, for publishing this title. I will welcome any suggestion and observation from students, teachers and other readers which would help in bringing out a revised and improved version of this title. Suggestions may please be sent to my e-mail address: gnilotpal@yahoo.com.

Nilotpal Ghosh

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AICRP	All India Coordinated Research Project
ALC	Avian Leucosis Complex
APF	Animal Protein Factor
APM	Animal Production and Management
BVSc & AH	Bachelor of Veterinary Science and Animal Husbandry
BBB	Broad Breasted Bronze
BBW	Broad Breasted White
BIS	Bureau of Indian Standards
BWD	Bacillary White Diarrhoea
Ca	Calcium
Ca(OH) ₂	Calcium Hydroxide
CARI	Central Avian Research Institute
CF	Crude Fibre
CP	Crude Protein
CPBF	Central Poultry Breeding Farm
CPDO	Central Poultry Development Organisation
CRD	Chronic Respiratory Disease
DAHD	Department of Animal Husbandry and Dairying (Now Department of Animal Husbandry, Dairying and Fishery)
DM	Dry Matter
DOC	Day-Old Chick
EDS	Egg Drop Syndrome
ESI	Egg Shape Index
FAO	Food and Agriculture Organisation
FAOSTAT	Statistics Division of Food and Agriculture Organisation
FCR	Feed Conversion Ratio
g	Gram
GDP	Gross Domestic Product
GI tract	Gastrointestinal Tract
GI weld	Galvanised Iron Weld
GNC	Groundnut Cake
HCl	Hydrochloric Acid
HDL	High-Density Lipoprotein
HDP	Hen Day Production
HHP	Hen Housed Production
HU	Haugh Unit
I/M	Intramuscular
IBD	Infectious Bursal Disease
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
IFOAM	International Federation of Organic Agriculture Movements
ITK	Indigenous Technological Knowledge
JAS	Japan Agricultural Standard
K ₂ O	Potassium Oxide
KAU	Kerala Agricultural University



kcal	Kilocalories
kg	Kilogram
KMnO ₄	Potassium Permanganate
KVAFSU	Karnataka Veterinary, Animal and Fishery Sciences University
LPM	Livestock Production Management
lux	SI unit of illuminance and luminous emittance, measuring luminous flux per unit area. It is equal to one lumen per square metre.
MD	Marek's Disease
ME	Metabolisable Energy
Mn	Manganese
NABARD	National Bank for Agriculture and Rural Development
NaCl	Sodium Chloride (common salt)
NAFED	National Agricultural Cooperative Marketing Federation of India Ltd
NBAGR	National Bureau of Animal Genetic Resources
NDDDB	National Dairy Development Board
NDF	Neutral Detergent Fibre
NECC	National Egg Coordination Committee
NFE	Nitrogen-Free Extract
NSOP	National Standards for Organic Production
NSPs	Non-Starch Polysaccharides
P	Phosphorus
P ₂ O ₅	Phosphorus Pentoxide
PDP	Project Directorate on Poultry
PDRC	Poultry Diagnostic Research Centre
PEF	Performance Efficiency Factor
PEI	Performance Efficiency Index
PPLO	Pleuropneumonia-like Organism
PSI	Pound-force per Square Inch/Pound per Square Inch
RD	Ranikhet Disease
RH	Relative Humidity
RIL	Routine Inclusion Level
RIR	Rhode Island Red
RNA	Ribonucleic Acid
RSPPTC	Random Sample Poultry Performance Testing Centre
S/C	Subcutaneous
SDS	Sudden Death Syndrome
TANUVAS/ TANVASU	Tamil Nadu Veterinary and Animal Sciences University
UAS, Bengaluru	University of Agricultural Sciences, Bengaluru
UK	United Kingdom
UP	Uttar Pradesh
USA/US	United States of America
USDA	United States Department of Agriculture
UT	Union Territories
VCI	Veterinary Council of India
WAMP	Week A Month Programme
WHO	World Health Organisation
WLH	White Leghorn
WTO	World Trade Organisation
Zn	Zinc

PART I

Avian Production Management

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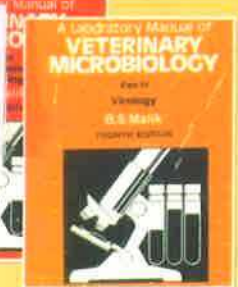
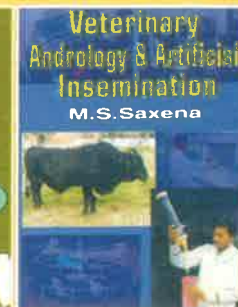
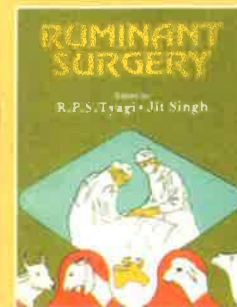
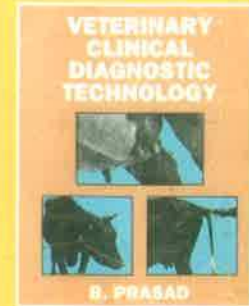
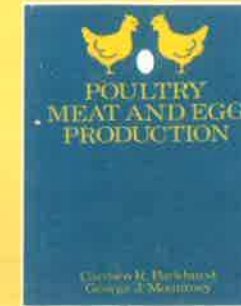
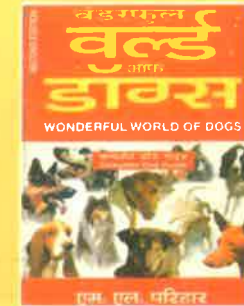
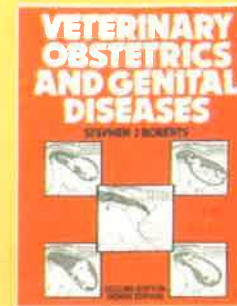
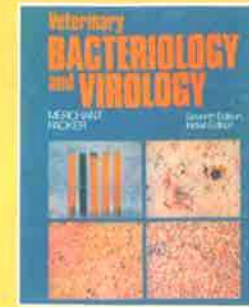
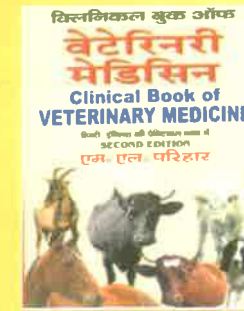
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