

POULTRY DISEASES

A Guide for Farmers & Poultry Professionals

Industry has been finally hit by bird flu. For want of an effective vaccine, it remains virtually defenceless. The disease has resurfaced, inflicting up to 60% mortality and ruining farmer's economy. Menace of viral, bacterial and protozoal diseases continues unabated. The drug resistance against antibiotics is on the increase. These are the harsh realities of today's poultry farming. The industry must face up to the challenges. In keeping with the present scenario, the second edition has been extensively revised. Many chapters are completely rewritten. The changes in particular include:

The section on avian influenza (bird flu) has been completely rewritten, covering all aspects of the disease with latest information. The disease is also illustrated with many coloured photographs showing changes in sick birds as well as the postmortem findings. Also, a summary of the Action Plan of the Government of India on the control and containment of avian Influenza is given.

The section on Marek's disease has been revised and updated. A lot of new information has been added on necrotic enteritis, Infection, Ranikhet disease, and most on every aspect of poultry health.

The chapter on 'The Avian Immune System' has been revised and updated. A new view of the problem of drug resistance and relative ineffectiveness of antibiotics, greater emphasis is placed on the prevention and control of diseases through biosecurity, hygiene, sanitation, and routine disinfection. The chapter on disinfection has therefore been revised and updated.

J.L. Vegad was Professor and Head, Department of Veterinary Pathology at Jawahar Krishi Vishwavidyalaya, Jabalpur. He was then Professor Emeritus of the Indian Council of Agricultural Research for two years. B.V.Sc. (Gold Medalist) from University of Madras (1958), Associate IVRI (1960), he obtained Ph.D. from New Zealand (1968) on Commonwealth Scholarship. His contributions are pioneering on chicken diseases. He has published more than 150 research papers, 60 of them in British, Indian, and New Zealand journals. Three of his Ph.D. students got the 'Jawahar Award' of the ICAR. He himself is recipient of 'Rafi Ahmed Kidwai Memorial Award' of the ICAR. Also, he has been honoured as the Best Teacher of JNKVV; with Fellowships of the Indian Association of Veterinary Pathologists; Society for Immunology and Immunopathology; and Indian Academy of Veterinary Sciences; Dr. C.M. Singh Samman; 'Dr. Nemi Chand Jain Lifetime Achievement Award' of the Indian Association of Veterinary Pathologists (IAVP); and with 'Dr. J.L. Vegad Award' under the auspices of IAVP. He was a Visiting Professor at the University of California, Davis, and author of three textbooks in veterinary pathology and two books on poultry diseases for farmers and poultry professionals. He has contributed a chapter in the 5th edition (2000) of Schalm's Textbook of Hematology published from USA. For seven years he was President of the Indian Association of Veterinary Pathologists. At present, he is an Adviser to the Phoenix Group, Jabalpur.



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Vegad

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Second Revised & Enlarged Edition

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J.L. Vegad

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Poultry Professionals

(Second Revised and Enlarged Edition)

J.L. VEGAD

Adviser

Phoenix Group
201/15, Ratan Colony,
P. B. 75, Gorakhpur,
Jabalpur - 482001



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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:** 36/14, Kalluvilakam, Lissie Hospital Road, Kochi - 682018
Ph: +91-484-4059061-65 • Fax: +91-484-4059065
E-mail: cochin@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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FOREWORD

The poultry industry continues to be a major and cheapest source of animal protein. Scientists have increased and exploited birds' genetic potential to the fullest. But there has not been a corresponding improvement in the structure of vital organs. Increased stress on the body gives rise to conditions like ascites in broilers and fatty liver-haemorrhagic syndrome in layers. Moreover, the picture of poultry diseases keeps constantly changing. Therefore, an adequate knowledge of poultry diseases is vital. This is precisely what Dr. J.L. Vegad's book aims at.

By contributing such a useful book for farmers and poultry professionals, Dr. Vegad has rendered a great service to industry. I do hope the book proves valuable in controlling poultry losses - the basic objective for which it is written. This book provides scientific insights to the layman farmers and practical insight to the pure scientists.

V. N. Dubey
Chairman, Phoenix Group
and
Mayor, Nagar Nigam, Jabalpur

PREFACE TO SECOND EDITION

The widespread popularity of the first edition among farmers and poultry professionals, feed and pharmaceutical personnel, poultry consultants, diagnostic laboratories, and veterinary students and teaching community has prompted me to bring out the Second Edition. I do hope this edition proves equally useful and is received with the same interest.

In the short period since the First Edition of the book was published in 2004, many things have happened. To begin with, the industry has been finally hit by avian influenza (bird flu), causing considerable disquiet and anxiety among poultry farmers. The industry at present has no potent weapon, such as an effective vaccine, to fight back. How then to contain the threat? Marek's disease has again raised its ugly head, inflicting up to 60% mortality in layers and ruining farmers' economy. Experts believe that useful life of Marek's disease vaccine is about 10 years. This is due to the evolution of more virulent strains. So, what next? The menace of diseases like Ranikhet and Gumboro, *E. coli* infection, mycoplasmosis, coccidiosis and others continues unabated. So much so that many antibiotics, that were once foolproof, are no longer that effective or reliable due to the phenomenon of drug resistance. Keeping these and several other points in view, the Second Edition is presented. It has been extensively revised and many chapters are completely rewritten. The changes in particular include:

- The section on avian influenza has been completely rewritten, covering all aspects of the disease with latest information. The disease is also illustrated with many coloured photographs showing changes in sick birds as well as the postmortem findings. **The pictures are from the recent Indian outbreak.** In addition, a summary of the Action Plan of the Government of India on the control and containment of avian influenza is given for general information.
- The section on Marek's disease has been revised and updated.
- A lot of new information has been added on necrotic enteritis, *E. coli* infection, Ranikhet disease, and almost on every aspect of poultry health.
- Chapter on 'The Avian Immune System' has been revised and updated.
- In view of the problem of drug resistance and relative ineffectiveness of antibiotics, the major thrust in this Edition is on the prevention and control of diseases through biosecurity, hygiene, sanitation, and disinfection. For example, with avian influenza, the vaccinated flocks cannot be considered influenza-free. However, the use of vaccine reduces the amount of virus shed. Or, with Ranikhet disease, although vaccination protects the birds against the disease, virus growth and shedding still occur, though at a reduced level. For this reason, the chapter on disinfection has been revised and updated.

- Finally, a major effort has been made to update company's products. Those that were no longer marketed are deleted and new ones included. Also, attempts have been made to include products from as many companies as possible.

I am grateful to Mr. Suneel Gomber, Manager, International Distributing Co., Lucknow, for the publication of this book. I express my sincere appreciation to Dr. Priti Mishra, Nutritionist and Mr. Satish Shukla, Microbiologist, Phoenix Laboratory for their generous help in the compilation of tables on medicines and vaccines. I tender my thanks to them both. The coloured photographs on avian influenza were obtained through the courtesy of both Department of Animal Husbandry, Government of Madhya Pradesh, while lecturing on a Bird Flu Training Programme, and Prof. R.N. Sreenivas Gowda, Vice-Chancellor, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar. I am grateful to them both. Thanks are due to Dr. R. K. Tripathi, Dr. Vijay Makhija, Dr. Mrigen Dutta, Dr. Chand Bahar, Mr. Vijay Tripathi, Mr. Pritesh Gupta, Mr. Praveen S. Pathradkar, Mr. Ganga Ram Chaudhary and Mr. Gajendra Rajput who all helped me in procuring the literature on pharmaceutical products. My special thanks are due to Mr. Vijay Parmar of Jabalpur Graphics who was most generous in extending help relating to computer work. Finally, I am grateful to my wife Nita Vegad for her tolerance and faith in me and my work.

J.L. Vegad

PREFACE TO FIRST EDITION

This book is written for poultry farmers and poultry professionals. The theme: effective disease diagnosis, treatment and control. The objective: prevention of losses, more profits and better economics.

The picture of poultry disease has changed over the years and the classical symptoms and postmortem findings, once so helpful in disease diagnosis, are no longer all that classical or helpful. Moreover, certain bacteria, like that of fowl cholera, have developed variations in their make-up through the years, giving rise to several different types of the same organism. Also, certain viruses, such as that of infectious bronchitis, have a natural tendency toward genetic mutation. This can lead to generation of new strains against which present vaccines may be totally ineffective. Such changes continually occurring in poultry health, and resultant disguised version of the disease, have not only confused the farmer but posed a serious challenge even for the professionals. In addition, several new diseases keep constantly knocking at the door. Therefore, unless diseases are properly diagnosed and effectively controlled, poultry farming can no longer remain a profitable proposition in the present competitiveness. It is with this objective that the book has been written, to acquaint the farmers with changing disease scenario and also with complexities of the problem. Change is the law of nature and poultry diseases are no exception. We must be well equipped for the challenges ahead. There will be no point in locking the stable door after the horse has run away!

The book has five sections, divided into 43 chapters. The first section deals with infectious, nutritional, and metabolic diseases as well as miscellaneous conditions. While the main emphasis is on diagnosis, treatment and control, other aspects have been dealt with for those interested to know more.

The second section is on disease diagnosis. The third relates to disease treatment/prevention. Apart from providing a comprehensive list of commercial medicines and vaccines, this section also covers important topics like antibiotic growth promoters, probiotics, mould inhibitors, toxin binders, enzymes, oligosaccharides, osmoregulators, methyl donors, acidifiers, and biosurfactants.

The fourth section discusses disease control. Disease-producing bacteria are abundant in the poultry world. This is because, like higher forms of life, they must also fight for their survival. Being small, they have been provided by nature with a survival potential and possess the ability to reproduce in extremely large numbers. These large numbers mean that their spread and presence will be extremely great. Therefore, to achieve the best results from any disease control programme, attention has to be given to the ways in which disease organisms can spread and examine management closely to find out where and how this spread can be minimized. All these aspects are dealt with in the first three chapters of this section, namely, biosecurity, disinfection, and sanitation.

Another important aspect of disease control discussed in the fourth section is the subject of vaccines and vaccination. Already there are so many commercial vaccines in the market and new ones keep coming. Also, so much technical literature keeps pouring all the time on immunity and chicken's immune system that the farmer is often confused and even lost. Keeping this in view, the fundamentals and certain basic concepts of the chicken's immune system are discussed. This is followed by a discussion of the impact nutrients have in boosting immunity in the chicken and thereby prevent early chick mortality. The remaining two chapters of this section devote to properties of the vaccines and various vaccination schedules.

The fifth and final section, 'tips on rearing and management', has been added with the firm belief that origin of more than 80% of the poultry health problems lies in poor management, and that there can be no profitable poultry industry without proper management. In fact, management is the bedrock on which productive poultry farming rests.

I hope the comprehensive coverage of poultry diseases from various angles will prove valuable to farmers in their continuous struggle to minimize losses from sickness and death, and in improving growth and performance of the birds. This would make poultry farming a worthwhile enterprise.

The book contains the latest information in a simplified manner, so that it is readily understood. Also, it has photographs, line-diagrams, figures and tables to further increase understanding of the text.

Though the book is written to meet the requirements of poultry farmers, it will be equally useful to poultry consultants, diagnostic laboratories, and feed and pharmaceutical professionals. In addition, the book will acquaint veterinary students and teaching community with the practical aspects of poultry health management.

In conclusion, I shall greatly appreciate receiving any comments/suggestions to enable me to improve the future edition of this book.

J.L. Vegad

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The work of writing such a book inevitably involves many helping hands.

First, I would like to express my gratitude to Shri V.N. Dubey, Chairman, Phoenix Group and Mayor, Nagar Nigam, Jabalpur, for writing 'FOREWORD' of the book. I am especially grateful to Shri D.R. Dangi, Chief Executive, Phoenix Group, for his being most helpful. While preparing section, "Tips on rearing and management", suggestions given by Dr. P. S. Atkare were very useful. He also devoted a large amount of time. I am grateful to him.

Dr. P.K. Tiwari, Shri S.K. Gorasia and Shri S.G Atkare of Phoenix Group were generous in many ways. Shri J. Khare helped in the computer work, and Shri Nishit Tiwari willingly typed the lengthy Chapter of 'Medicines and Vaccines'. In fact, all the staff of Phoenix Group were most helpful. I tender my thanks to them all.

Dr. Priti Mishra, Nutritionist, Phoenix Lab, prepared chapter 19 on commercial medicines and vaccines. She was painstaking, meticulous and assiduously at it till the work was completed. Dr. Madhu Swamy, Associate Professor of Veterinary Pathology, took pains and gave enough time in going through the manuscript. I am grateful to them both. Thanks are also due to Miss Jyoti Tamsikar, Microbiologist, Phoenix Lab, for her help. I thank Shri Ganga Ram Choudhary of Phoenix Lab for discussions on practical aspects of poultry management, and Shri Gajendra Rajput for his assistance.

I am grateful to Shri Suneel Gomber, Manager, International Book Distributing Co., Lucknow, for publication of the book. Dr. Vijay Makhija gave useful suggestions and Shri Brajesh Shrivastava of Sunrays Marketing was helpful. I am thankful to them both.

Shri Anand Parmar and Shri Vijay Parmar of Jabalpur Graphics; and Shri Sharad Vegad, Shri Dilip Vegad and Shri Amit Vegad were most generous in extending help related to scanning and computer work. Finally, it is indeed a great pleasure to express my appreciation to members of my joint family for their patience and understanding. I am especially grateful to my wife Nita and my eldest brother Amrit Lal Vegad for the moral support, and for their faith in me and my task.

J.L. Vegad

ABBREVIATIONS

| | | |
|--------|---|---|
| B.P. | = | British pharmacopoeia |
| BWD | = | Bacillary white diarrhoea |
| °C | = | Degree Celsius |
| C.F.U. | = | Colony forming unit |
| CCRD | = | Complicated chronic respiratory disease |
| cm | = | Centimetre |
| CRD | = | Chronic respiratory disease |
| DNA | = | Deoxyribonucleic acid |
| e. g. | = | For example |
| EID | = | Egg infective dose |
| Exts | = | Extracts |
| °F | = | Degree of Fahrenheit |
| FCR | = | Feed conversion ratio |
| Ft | = | Foot |
| g | = | Gram |
| G | = | Greek |
| Gal | = | Gallon |
| GI | = | Gastro-intestinal |
| h | = | Hour |
| hrs | = | Hours |
| HCl | = | Hydrochloric acid |
| i.e. | = | That is |
| I/M | = | Intramuscular |
| Inj | = | Injection |
| I.P. | = | Indian pharmacopoeia |
| I.U. | = | International unit |
| I/V | = | Intravenous |
| Kg | = | Kilogramme |
| L | = | Latin, also litre |
| Lb | = | Pound |
| LD50 | = | Minimal lethal dose |
| Liq | = | Liquid |
| M | = | Metre |

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4. International Hatchery Practice (2005) Volume 19, Number 3, page 31

This tome of over 800 pages is divided into five sections. These sections focus on diseases, disease diagnosis, disease treatment/prevention, disease control and tips on rearing and management.

This is the first ever such book to be written for an Indian audience (although it is just as valuable to readers virtually anywhere else in the world) and its objective is the prevention of losses, and the creation of more profits and better economics.

Although the text is relatively devoid of tables, diagrams and pictures it is not that heavy to read because **it is carefully broken down into logical sections** and bold text is liberally used to highlight key words and phrases.

Central to the book is a 'table' that covers some 275 pages that provides a comprehensive review of antibiotics, feed additives, vaccines and anything else that can be given to a bird!

For every substance four columns entitled 'trade name and company', 'composition', 'indications', and 'dosage/administration' ensure that **this is probably the most comprehensive table of this type that the reviewer has ever seen.**

The book has a unique blend of technical information and its practical application. This is a real credit to its author as it is a reflection of his real and lasting input into veterinary education in India for over 50 years.

If one has a criticism of this tome it is **'why did the publishers put such a useful text, that will be constantly referred to by the reader, in a paperback?'**

Surely this must be an indication that they expect to publish a second edition in a couple of years time!

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