

POULTRY PRODUCTION

in

Hot Climatic Zones



H.C. Saxena

E.H. Ketelaars

POULTRY PRODUCTION in Hot Climatic Zones

H.C. Saxena E.H. Ketelaars



Rs. 125.00

ISBN 978-81-272-4398-2



KALYANI PUBLISHERS

27A
2611

POULTRY PRODUCTION IN HOT CLIMATIC ZONES

**DR. H.C. SAXENA
&
Professor E.H. KETELAARS**



KALYANI PUBLISHERS

LUDHIANA - NEW DELHI - NOIDA (U.P.) - HYDERABAD
CHENNAI - KOLKATA - CUTTACK - GUWAHATI - KOCHI

KALYANI PUBLISHERS

Head Office :

B-I/1292, Rajinder Nagar, Ludhiana-141 008

e-mail : kalyanibooks@yahoo.co.in

Administrative Office :

4779, Ansari Road,
23, Daryaganj, New Delhi-110 002

Works :

B-16, Sector 8, Noida (U.P.)

Branches :

1, Mahalakshmi Street,
T. Nagar, Chennai-600 017
110/111, Bharatia Towers Badambadi
Cuttack-753 009 (Orissa)

3-5-1108, Narayanaguda, Hyderabad-500 029 (A.P.)

10/2B, Ramanath Mazumdar Street,
Kolkata-700 009

1st Floor, Saraswati Road, Pan Bazar,
Guwahati-781 001

Convent Road Kochi-682 035

KPPE 1926 05

© 1993, Dr. Saxena H.C. & Ketelaars, E.H.

First Edition,	1993
Second Edition,	2000
Third Revised & Enlarged Edition,	2008

Typesetting & Diagrams by:
(POULTR-8)

Datalink Computer
213-Sangam Complex, Milap Chowk,
Jalandhar-144 001. Ph: 0181-2213422

ISBN - 978-81-272-4398-2

PRINTED IN INDIA

At Kalyani Printings B-15, Sector 8, NOIDA (U.P.)
and Published by Mrs. Usha Raj Kumar for
Kalyani Publishers, New Delhi-110 002.

PREFACE (Third Edition)

In every short time, we have been asked by our Publishers to revise and update and bring out the 3rd Edition of our book entitled "Poultry Production in Hot Climatic Zones".

The manner in which the first two editions were received by Poultry Managers all over the world has encouraged us tremendously and it is with great pleasure that we are now bringing out the 3rd Edition of our book.

First edition of the book was in 1993 and the second edition came out in the year 2000. We have taken pains to revise, update and enlarge this book to the best of our abilities and make it more useful to its readers-Poultry Farm Managers, Students of Poultry Science and Poultry Farmers in the small and medium sector. Our publisher has promised to improve the get up of the book as well.

The practical nature of the book remains the hallmark of this publication. Poultry Farming in hot climate zones has spread very rapidly, resulting in large commercially run poultry enterprises, in all countries that we know, in so called hot climate zones. We now see many farms/enterprises being managed by well trained and experienced managers-who needed theoretical knowledge but also practical application of good poultry farming practices on the farm they work and produce good results. Our book came in handy for such managers as we saw it during our travels all over the world during last 25 years.

Knowledge knows no bounds and we needed to update the material in this book and elsewhere all the time and to that extend I am reminded of what I saw on the table of that great communicator former US President Ronald Reagan which said, "it can be done". In India, Mr. Azim Premji, Chairman WIPRO said "You should dare to dream, define what you stand for, never lose your zest and curiosity, always strive for excellence, build self confidence, learn to work in teams, take care of yourself, persevere, have a broader social vision and finally never let success go to your head." His 10 point success formula, which we know, many successful people follow all their lives; have been benefited most.

We hope this book will reach thousand of small, medium and large Poultry Entrepreneurs all over the world who are in need of greater insight into poultry farm technology and their knowledge will produce success for the enterprises they manage or own.

We hope this book will help the cause of successful profitable poultry production in all developing and developed countries in tropical as also in temperate zones of the world.

2008

Dr. H.C. Saxena

Prof. Dr. E.H. Ketelaars

ABOUT THE BOOK

This is the book you have been waiting for. 'POULTRY PRODUCTION IN HOT CLIMATIC ZONES' has been designed for use by Poultry Farm Managers specially those working in hot climatic zones.

It is also intended to serve as a text for the first course in Poultry Production offered by Colleges and Universities in countries that fall in tropical as temperate zones. The need for such a book has been expressed many times during the past two decades by poultry experts from some 40 countries at several international symposia. They have been unanimous in calling for a multiple use book providing basic knowledge of the operational aspects of running a poultry enterprise and also serve as an authentic reference text for poultry project managers.

We have made effort to ensure that all information needed is easily available. The book contains bit of biology, besides environment and health before bringing in nutrition and feeding, breeder and layer management, hatching management and disease control.

Poultry Production is gaining tremendous popularity in all so called developing countries. More projects are coming up to provide poultry meat and eggs. Poultry products are no more foods for the rich, they have indeed become common man's food in many countries as we see per capita consumption of meat and eggs rise every year.

We hope readers will like the book as it is bound to help successful and profitable poultry production.

ABOUT THE AUTHORS

Dr. H.C. SAXENA, born in 1930, received his education at the Allahabad Agricultural Institute. He then went to Washington State University where he obtained his M.Sc. and Ph.D. degrees in Poultry Nutrition. Dr. Saxena joined Hindustan Unilever Limited in 1964 where he worked as the *Product Group Manager, Animal Feeds*.

Dr. Saxena was in the Middle East where he managed very large livestock projects at Kuwait and at Jeddah. Dr. Saxena ushered modern Poultry Industry in India and is generally recognized as a pioneer founding father for this Industry in India.

Dr. Saxena has been selected to work with the World Bank as Consultant in Nigeria, Ghana and Mauritania where he was successfully completed 4 major poultry projects. He visits Oman frequently. He was nominated for the World Food Prize in 2001.

Prof. Dr. E.H. KETELAARS, born in 1926, graduated at the Agricultural University of Wageningen in The Netherlands.

He started his career in the Advisory Service of the Ministry of Agriculture and became Head of the Poultry Advisory Service in the south of the country, where the poultry industry experienced a tremendous development from traditional small scale poultry keeping to a modern industry.

In 1979 he became a Professor of Poultry Science at the Agricultural University.

With his practical experience for years and the subsequent scientific career he became a well known expert in the poultry industry of the Netherlands.

PREFACE (First Edition)

This book has been designed for use by the poultry farm managers, especially those working in hot climatic zones. Beside, it is intended to serve as a text in the first course in poultry production offered by colleges and universities in countries that again fall in the hot climatic zones. The need for such a book has been expressed many times during the past decade by poultry experts from some about 40 countries at several symposia. They have been unanimous in calling for a multiple-use book which can impart basic knowledge of the operational aspects of running a poultry farm, and also serves as an authoritative reference text for poultry project managers.

With this objective in mind, the book has been structured so that coverage of the subject matter and its presentation allows for its efficient use by managers, students and instructors with minimum expenditure of time. We have made an effort to ensure that all information needed is easily available. Thus, we have discussed a little bit of biology, besides environment and housing before bringing in nutrition and feeding, breeder and layer management, hatchery management and diseases control. However, the sequence of chapters need not be followed rigidly, because, in such subjects there is considerable overlap, and cross-references becomes necessary.

This volume will primarily help managers of poultry farms, whether large or small, in countries of Africa, the Middle East and Far East. We have kept in mind the requirements of not only large poultry producers, but also of the small poultry farmers in developing countries. It is hoped that this book will lead poultry managers to appreciate that successful poultry production, especially in hot climatic zones, flows from both timely application of sound business principles and thorough understanding of the physiological conditions in which they are reared.

Poultry production is gaining tremendous popularity in developing countries. More and more farmers, businessmen, retired officials and others are taking to intensive poultry production to provide poultry meat and eggs which are increasingly becoming the common man's food in many countries. We hope this book will help the cause of successful and profitable poultry production in all developing countries in hot climatic zones.

January 1, 1993

Dr. H.C. Saxena

Prof. Dr. E.H. Ketelaars

CONTENTS

	Pages
1. BIOLOGY OF THE FOWL	1-10
2. POULTRY BREEDING	11-14
3. ENVIRONMENTAL REQUIREMENTS OF POULTRY	15-22
4. POULTRY HOUSING	23-27
5. ENVIRONMENTAL CONTROL	28-35
6. LIGHTING MANAGEMENT	36-40
7. POULTRY NUTRITION	41-49
8. FEED FORMULATION AND MANUFACTURING	50-59
9. QUALITY CONTROL OF FEEDS	60-74
10. WATER SUPPLY	75-80
11. BREEDER MANAGEMENT	81-83
12. HATCHERY MANAGEMENT	84-92
13. PULLET REARING	93-97
14. HOUSING AND EQUIPMENT FOR LAYERS	98-104
15. FLOOR LAYER MANAGEMENT	105-107
16. CAGE LAYER MANAGEMENT	108-112
17. EGG COLLECTION	113-120

	Pages
18. EGG PRODUCTION STANDARDS	121-134
19. RECORDS AND COSTING SYSTEM FOR LAYERS	135-140
20. BROILER PRODUCTION MANAGEMENT	141-144
21. DISEASE PREVENTION	145-147
22. IMMUNITY AND VACCINATION	148-152
23. CONTROL OF FLIES ON THE FARMS	153-154
24. WASTE MANAGEMENT	155-161
25. MARKETING OF EGGS AND POULTRY MEAT	162-165
26. POULTRY INDUSTRY AS AN AGRIBUSINESS	166-169
27. MANPOWER TRAINING AND SELECTION	170-173
28. NUTRITIVE VALUE OF EGGS AND POULTRY MEAT	174-176
29. EXTENDING YOUR POULTRY KNOWLEDGE	177-180
GLOSSARY	181-192

1

BIOLOGY OF THE FOWL

Managers of poultry enterprises cannot function effectively without some basic knowledge of the biology of the fowl. In order to give them a better understanding of the physiological background of what is going on, and what they can expect from the various measures they take to keep the flock healthy and productive, a brief elucidation of some major aspects of the biology of the fowl is given in the preliminary chapters.

Birds are in many respects different from mammals. Although both animal species are homeotherms, which means that they keep their body temperature at a relatively constant level; their methods of doing so are not the same. In other words, their thermo-regulation is different.

For regulating their temperature the birds have specific energy requirements and therefore they respond specifically to different energy situations.

Besides, there are distinct differences between birds and mammals in the processes of digestion and assimilation of nutrients. Finally, the reproduction of birds is obviously very different from that of mammals.

1.1 THERMO-REGULATION OF POULTRY FOWL

Poultry maintain their body or core temperature at about the same level over a wide range of ambient temperatures. The body temperature of the adult fowl varies, but only slightly, around 41 to 42°C, depending on factors such as breed, bird size, age, sex, nutritional status, feathering conditions and activity, as well as on a number of environmental factors, including the ambient temperature which is most important.