

## About the Author



**Dr.** Arun Kumar Panda completed his graduation (BVSC & AH) from Orissa Veterinary College under Orissa University of Agriculture and Technology, Bhubaneswar, Orissa in the year 1992. Subsequently he obtained his MVSC and Ph. D degree in Animal Nutrition from Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh. He is a Post-Doctoral Fellow of Oregon State University, Corvallis, Oregon, USA. Dr. Panda joined Agricultural Research Service of Indian Council of Agricultural Research by securing first position in the discipline of Animal Nutrition and posted as Scientist at Project Directorate on Poultry, Hyderabad, Andhra Pradesh in the year 1997. Since then, he is working in the same institute and presently he is holding the post of Senior Scientist.

He has more than 15 years of research experience in the field of Poultry Nutrition. His specific research interest includes nutrient requirement of chicken in tropics, role of nutrition in early life programming of broiler chickens and production of designer egg and meat through nutritional manipulations. He has published more than 150 research articles in various national and international research journals and about 100 technical articles in scientific magazines. In addition he has authored 5 books and 3 bulletins. He has received several recognitions from various organizations like UB Singh Memorial Young Scientist Award, ND Kehar Award, Kerala Chapter Research Award, etc.

Price: PB Rs. 395/-, USD 14

**HIND PUBLICATIONS**

# 204, Plot No. 19, Huda Complex, Saroor Nagar,  
Hyderabad -35, A.P., India

Phone: 91-40-24042046, Mobile: 093913 78805

E-mail : hindpoultry@hotmail.com, Website : www.hindpoultry.com

ISBN.NO : 978-81-921-893-5-2

**POULTRY FEEDSTUFFS & FEED ADDITIVES**

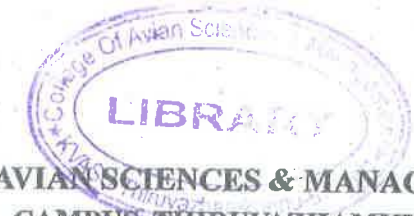
# POULTRY FEEDSTUFFS & FEED ADDITIVES

**A.K.PANDA**



**HIND PUBLICATIONS**

2238

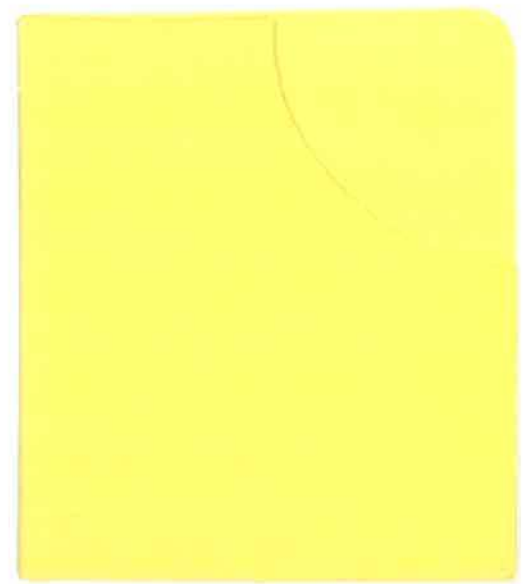


**COLLEGE OF AVIAN SCIENCES & MANAGEMENT**  
**KVASU CAMPUS, THIRUVAZHAMKUNNU**

Acc. No. 2238.....

Call No.....

**This book should be returned on or before the date last given below.**



--	--	--

# **Poultry Feedstuffs and Feed Additives**

**By  
Dr. A.K. Panda**

Published By  
**HIND PUBLICATIONS**  
# 204, Plot No. 19, HUDA Complex,  
Saroor Nagar, Hyderabad - 500 035. India.  
Phone : 040-24042046, Mobile : 09391378805.  
E-mail : hindpoultry@hotmail.com ,  
Website : www.hindpoultry.com



Published By

## **HIND PUBLICATIONS**

# 204, Plot No. 19, HUDA Complex,  
Saroor Nagar, Hyderabad - 500 035. India.  
Phone : 040-24042046, Mobile : 09391378805.  
E-mail : hindpoultry@hotmail.com ,  
Website : www.hindpoultry.com

First Edition : 2013

Price Rs. 395/-

ISBN : 978-93-83397-00-6

© With Publisher  
All Right Reserved

No Part of this publication may be reproduced  
or stored in a retrieval system or transmitted,  
in any form or by any means, Electronic,  
Mechanical, Photo Copying, Recording or  
otherwise, without the prior written permission  
of the publisher.

*Designed by :*  
**Smart Multimedia**  
Dilsukhnagar, Hyderabad.

*Printed at :*  
**Akruthi Qffset Printers**  
Chikkadpally, Hyderabad.

## **CONTENTS**

<b>Chapter</b>	<b>Title</b>	<b>Page No.</b>
	Preface	4-5
1.	Introduction	6-11
2.	Nutrient Requirements of Poultry	12-18
3.	Poultry Feedstuffs	19-24
3.1	Cereals and Their Byproducts	25-52
3.2	Some Other Energy Sources	53-59
3.3	Plant Protein Sources	60-89
3.4	Animal Protein Sources	90-99
3.5	Fats and Oils	100-109
3.6	Minerals Sources	110-117
3.7	Vitamin Sources	118-119
3.8	Synthetic Amino Acid Sources	120-121
4.	Feed Additives	122-153
5.	New Generation Additives	154-159
6.	Poultry Feed Safety	160-174
7.	Precision Poultry Feeding	175-184
8.	Glossary	185-195

## PREFACE

The production of poultry meat and eggs has increased consistently over the years and this trend is expected to continue. With rapid economic growth, urbanization and higher household incomes, the demand for animal proteins in India will increase in the year to come. Due to rapid advances in genetic selection, modern day commercial poultry has fast growth rate and feed efficiency in broilers and egg production in layers. To exploit the genetic potential for growth and production, use of well balanced nutrient dense diets has become a common practice in the commercial poultry industry. Poultry nutritionists are consistently exercising their expertise for accurate feed formulation to maximize the economic efficiency. Feed represents the greatest single expenditure (65-80 %) associated with poultry production. Feed cost is the major constraints but a greater mean for manipulating production cost and making poultry enterprise profitable. The rapid growth in poultry production is having a profound effect on the demand for feed and raw materials. The availability of low priced-high quality feed ingredients is critical to the poultry industry for competitive and sustainable growth to meet the demand for animal protein. Formulation of balanced diet at least cost has become an essential need for increasing economic efficiency of poultry production. Considerable advances have already been made on understanding nutrient metabolism and requirements by the bird, the available feed resources and formulating a balance feed through least cost or best cost feed formulation. The need of the hour is to fine-tune the diet so that they match closely the requirements of the birds. Public concerns over food safety from the food of animal origin is a cause of global concern in the recent years due to problems such as bovine spongiform encephalopathy (BSE), dioxin and melamine contaminations, microbial resistance to antibiotics and outbreak of food borne bacterial infections (food poisoning).

The purpose of the book is to educate the readers about the possible feedstuffs that can be used for making a wholesome balanced feed for poultry. Besides a liberal supply of well-balanced feed, its effective utilization by bird is equally important. In the modern feeding practices, feed additives are assuming a position of prime importance in poultry nutrition for enhancing productivity and efficiency. The routine, promising and new generation feed additives have discussed. From a nutrition point of view, the most obvious strategy is to feed birds to match the requirement (precision feeding) to improve the efficiency of bird's nutrient utilization and to reduce excretion of nutrients to the environment. The approaches for realistic precision poultry feeding are discussed. Poultry feed safety and its regulation has become a major international concern to produce safe poultry food such as meat and eggs also included. I have attempted to include as much up to date and relevant information on feedstuffs available for poultry feedings, feed additives, precision poultry feeding and poultry feed safety in the book for the benefit of poultry industry. I hope the information contained in the book will be helpful to the poultry farmers, feed manufacturers, students, teachers, researchers and all those associated with poultry enterprises.

**A.K. Panda**

