Networking Nationally from Hyderabad

POULTRYLINE

Readership — Poultry Wide

VOLUME - 21 ISSUE - 12 ANNUAL SUBSCRIPTION RS. 500/- DECEMBER 2021 Rs. 50/-

Trust Forms The Core Of Our 'BONDS'...

When it comes to setting higher benchmark of performance as compared to other chelated mineral sources; producers across the world spread over 100 countries, trust MINTREX®.

MINTREX® is the only globally available bis-chelate where one molecule of metal is attached to two molecules of HMTBa (2 hydroxy-4-methylthio-butanoic acid) by strong bonds. The unique, stable and neutrally charged structure of MINTREX® minerals lead to higher absorption, bioavailability and production performance as compared to other mineral sources. The uniqueness of MINTREX® minerals has been recognized by various international bodies like EU and AAFCO by classifying them as a distinguished class of minerals.

Zn 80% Methionine Value

Cu 78% Methionine Value

Mn 76% Methionine Value

Building 'BONDS' Stronger

www.novusint.com

+ 15 Years + MINTREX 2004-2019 ANNIVERSARY

TMO and TMO Plus
(For 'Trace Mineral Optimization' in Poultry)

NOVUS®

Venworld
THE BEST IN ANIMAL HEALTHCARE

NATURAL PROTECTION

The gut and its resident bacterial flora play an important role in the development of the immune system and resistance to disease

Under natural brooding conditions chicks obtain their gut flora from their mother & the environment

WHAT ABOUT ARTIFICIAL INCUBATION

AVIFLORA

Unique natural microflora for avian species

VENKATESHWARA B.V. BIOCORP

VENKATESHWARA B. V. BIOCORP PRIVATE LIMITED
(An ISO 9001:22000, HACCP, FAMI QS & GMP Certified Company)
Venkateshwara House', S. No. 114/A/2, Pune-Sinhagad Road, Pune-411030
Tel.: (020) 24251803, Fax: +91-20-24251060/24251077
Website: www.venkateshwarabvbiocorp.com

In technical collaboration with LALLEMAND

The RIGHT FEED

SUGUNA FEEDS®

Dependable, Anywhere, Anytime

Suguna Broiler Feed

PBS | BS | BF | BC-10% | BC-40%

- ✓ Better FCR
- ✓ Better Livability
- ✓ Faster Growth

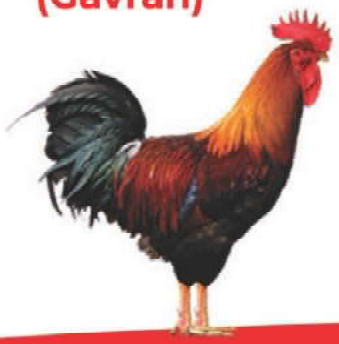
Suguna Layer Feed

LSC | LCC | LGC | LLC | LC 35% | LC 40%

- ✓ Better Livability
- ✓ Lowest Feed Cost
- ✓ More Eggs

Suguna Country Chicken Feed (Gavran)

CCS | CCF



- ✓ Balanced Diet
- ✓ Rich in Nutrients
- ✓ Better Weight Gain

For Trade Enquiries: 96504 37700 | www.sugunafoods.com

SUGUNA FOODS
Breeding Trust, Growing Together

VVMD-VAC®

Marek's Disease Vaccine

Marek's Disease Vaccine, Serotype 2 - 301 B1
Strain & Serotype 3 - FC # 126 Strain

VVMD-VAC®

- Early sensitization
- Proven efficacy
- High immunogenicity
- Patented
- Low passage
- Faster replication rate
- Superior protection
- Single shot

zoetis
FOR ANIMALS. FOR HEALTH. FOR YOU

Zoetis India Limited
31, 3rd Floor, Kalpataru Synergy, opp. Grand Hyatt, Santacruz (East), Mumbai- 400 055; • Web: www.zoetis.in • Email: indiaanimalhealth@zoetis.com

VOL.21 ISSUE 12 DECEMBER 2021

POULTRY LINE
పౌల్ట్రీ లైన్

CONTENTS

1. Emu Farming: to ....Income of Farmers
- Suraj Amrutkar 13-17

2. Broiler Rates 18

3. Multiple Mycotoxinsand t... Poultry Industry
- Dr S.K.Maini 25-26

4. Feeding and Nutrition of poultry
- B.K. Ojha 29-32

5. Pigeon Farming: to Double the Income ....
- Suraj Amrutkar 46-49

6. NECC Egg Rates 50

7. Press Releases .....
23-24, 27-28, 41-45, 55-62

TEJASVI PUBLICATIONS
2-1-444/16, 1st Floor, O.U.Road, Nallakunta, Hyd. - 500 044.
Ph: 040-2761 0027, Cell : 98493 68003, 63096 77047
www.tezasvipublications.com
E-mail : tezasvipoultryline@gmail.com
tejasvi_poultryline@rediffmail.com

Printed, Published and Owned by B. Kalyan Kumar, Printed at Karshak Art Printers, 40, A.P.H.B. Blocks, Vidyanagar, Hyderabad - 500 044. India.
Published at 2-1-444/16, 1st Floor, O.U.Road, Nallakunta,Hyd-44. Editor: B. Shiv Shankar.

INDEX OF ADVERTISEMENTS

Particulars	Page No.	Particulars	Page No.
Alltech Biotechnology Pvt Ltd.,	Inside Colour 9	Nutridian Animal Health	Inside Colour 3
Animal Wellness Products	Inside Colour 69	NuTech Bio Sciences Pvt. Ltd.	Inside Colour 34
APC Nutrients Pvt. Ltd.,	Inside Colour 35	Optima Life Sciences Pvt. Ltd.	Inside Colour 70
Biomin Singapore Pvt. Ltd.	Inside Colour 40	Poultry Consultancy Services	24
Boehringer Ingelheim India Pvt. Ltd.,	Inside Colour 10	Provet Pharma Pvt Ltd.	Inside Colour 39
Ceva Polchem Private Limited	Inside Colour 65 & 68	Regen Bio-Corp	Inside Colour 67
DSM Nutritional Products India Pvt Ltd.	Inside Colour 8	Rossari Biotech Limited	Inside Colour 63
Eco-Mix Feed Formulations & Software	12	Rovitex Agro Chem	Inside Colour 38
Exotic Bio Solutions Pvt. Ltd.	Inside Colour 66	Sai Krishna Plastic Industries	Inside Colour 64
Fauna Remedies Inc.	Inside Colour 6	Shri Laxmi Ganapathi Agencies	28
Hipra India Pvt. Ltd.	Inside Colour 5	Srinivasa Farms Private Limited	Inside Colour 51
Huvepharma	Inside Colour 53	Suguna Foods	InsideTitle Fold 4
Indian Agro & Food Industries Ltd.	Inside Colour 4	Uttara Impex Pvt. Ltd.	Inside Colour 20, 21 & 22
Karamsar	26	VHPL	Inside Title Fold 3, Inside Colour 19, 33 Title Cover IV
Lumis Biotech Pvt. Ltd.	Title Cover I	Volschendorf Enterprises Pvt Ltd.	Inside Colour 52
MSD Animal Health	Title Cover III	Zeus Biotech Limited	Inside Colour 54
Natural Remedies Pvt. Ltd.	Inside Colour 36 & 37	Zoetis India Limited	Inside Colour 7
Novus Animal Nutrition (India) Pvt Ltd	Title Cover II		

Emu Farming: to Double the Income of Farmers

Suraj Amrutkar[1], Suhas Amrutkar[2], Bharti Deshmukh[3], Vinod Gupta[4] and S. K. Gupta[5]

1. Scientist, Poultry Science, SKUAST-J, Jammu.
2. SMS, Animal Nutrition, Parbhani Veterinary College, Parbhani, MAFSU
3. Assistant Professor, GADVASU, Punjab
4. Senior Scientist & Head, KVK Samba, SKUAST-J
5. Professor & Librarian, Medicine Division, SKUAST-J

Introduction:

Suraj Amrutkar

Emu (*Dromadius navaehollandiae*) are reared commercially in many parts of the world for their meat, oil, skin and feathers, which are high economic value. Emu is considered as one of the latest emerging species in India. It is an exciting and rewarding new agri-business. Next to the ostrich, the Emu is the largest living flightless bird, standing more than 1.5 m tall, length varies from 130-190 cm, weight more than 45-55 kg, the wings are atrophied and the feathers are of earth-greyish to grey-brownish colour. Emus are curious and docile birds. Emu has a more slender body than an ostrich. But it has a shorter neck covered with feathers and fattier than an Ostrich. Body is covered with drab coloured plumage and both the sexes are similar having dark grey head and neck. There are no large decorative plumes in the male's tail. The feathers are very primitive and look like coarse hair.

The anatomical and physiological feathers of these birds appear to be suitable for temperate and tropical climatic conditions. These birds can be well maintained on extensive and semi-intensive rearing systems with reasonably high fibrous diets. United state, Australia and China are leading in Emu. Emu is introduced recently into India. The Emu is a large flightless bird. They have 3 toes and long legs which allows them to run extremely fast. In this species, the female is larger than the male. Emu, feed on grass, leaves and small insects. They live all over Australia in grasslands. The female lays up to 20 eggs, which are large and are soft dark green in colour. These eggs are often prized not only by humans for decoration pieces, but by animals as a food source. The male incubates the eggs for a period of 7-8 weeks, and does not leave the nest for this period. When the eggs hatch, the male Emu looks after the hatchlings for another six month. The Emu is

Production figures of Emu:

Age at sexual maturity	2 years
Number of eggs/years	Ist year breeder: 8-12 eggs under Natural Incubation 16-24 eggs under Artificial Incubation
Male: Female ratio for breeding Emu	1:1 or 1:2
Weight at hatch	420 gm
Weight at 3 months age	8 kg
Weight at 12 months age	30 kg (slaughter age)
Weight at 24 months age	50 kg (breeding age)

the world's third largest bird. The Ostrich and Cassowary take the top positions. The nest of an Emu can be up to 1.5 meters wide.

Habitat: The Emu is found only in Australia. It lives throughout most of the continent, ranging from coastal regions to high in the Snowy Mountains.

Management of Chicks: Emu chick weight is about 370 to 450 gm (about 67% of egg weight) depending on the size of egg. First 48-72 hours, Emu chicks are restricted to incubator for quick absorption of the yolk and proper drying. Like chicken, Emu needs brooding during their early life. Clean and disinfect brooding shed thoroughly well in advance of receiving chicks, spread litter (paddy husk) cover new gunny bag over the litter. Arrange a set of brooder for about 25-40 chicks giving 4 square feet per chick for first 3 weeks. Provide brooding temperature of 90°F at first 10 days and 85°F till 3-4 weeks. Proper temperature makes the brood successful. Provide sufficient water mugs of a liter capacity and equal of feeder troughs under the brooder. A chick guard must be 2.5 feet height to avoid jumping and straying of chicks. Provide 24 hours of one foot candle light i.e. 40 watt bulb for every 100 square feet areas. Offer small pieces of carrot to the Emu chicks since the birds readily catch and also are attracted. After 3 weeks of age, slowly extend the brooder area by widening the chick guard circle and later remove it by the time chicks attain 6 weeks. Feed starter mash for the bird 14 weeks or till attaining standard body weight of 10 kg. Ensure proper floor space for the birds housed as these birds require run space for their healthy life. 30 feet run space is provided. Floor must be easily drained and free from dampness. Periodical body weights on 10% of birds will be easily drained and free from dampness. Periodical body weights on 10% of birds will give a scope for correction of management defects.

Grower Management: As Emu chicks grow, they require a bigger size of waters and feeders and increased floor space. Identify the sexes and rear them separately. If necessary, place sufficient paddy husk in the pen to manage the litter in good and dry condition. Feed the birds on grower mash till birds attain 34 weeks age or 25 kg body weight. Offer greens about 10% of diet particularly different kinds of leaf meals for making the birds eat adapt to fibrous diets. Provide clean water all the time and offer feed as much as they want. Ensure dry litter conditions throughout the grower stage. If necessary add required quantity of paddy husk to the pen. Provide 40 ft X 100ft space for 40 birds if outdoor space is considered. Floor must be easily drained and avoid dampness. Restrain the younger birds by securing the body by side ways and hold the body firmly. Sub adults and adults can be secured by holding the wing by side way and held the bird by grabbing both the wings and place by dragging closely to a person's legs. Never allow bird to kick. Bird can kick sideways and front ways. Hence, better securing and firm holding is necessary to avoid harming the bird as well as person.

Chemical composition of Emu egg:

Shape Index	66.7
Egg Yolk Dry matter %	54.14
Egg Yolk Protein %	15.54
Egg Yolk Fat %	35.84
Egg Yolk Ash %	1.7
Egg White Protein %	9.58
Egg White Ash %	0.71

Fattening / Finishing stage: Growing Emu need to be fattened to improve body weight (40 kg) and FCR (1:5) at the time of marketing for table purpose. Offer finisher ration from 35 weeks of age to slaughter or up to 12-18 months age. Bird's yield 53% dressed meat and 3-4 liter of fat. Inclusion of vegetable fat at 3-5% in Emu diet will fetch better FCR and net returns since the birds at this age utilizes fat in an efficient way compared to the chicks of young age of less than 15 weeks. The sub adults kept for breeding purpose need to be fed on maintenance feed specially made for this purpose

from 35th week age to sexual maturity by 18-24 months.

Breeder Management: Emu birds attain sexual maturity by 18-24 months age. Choose pairing should be done based on the compatibility. During mating, offer floor space about 2500 square feet (100 x 25) per pair. Trees and shrubs may be provided for privacy programme and fortify with minerals and vitamins to ensure better fertility and hatchability in birds. Semen collection and artificial insemination was successful in Emu so that the cost of male maintenance could be minimized. Its implementation needs skill. Soon after breeding season, separate the sexes and house them in flock and feed on maintenance ration. Normally adult bird consumes 1 kg feed/ day but during breeding season feed intake will be drastically reduced hence intake of nutrients must be ensured.

Nutrient requirement of Emu:

Nutrient requirement	Starter	Grower	Finisher	Breeder	Maintenance
Metabolizable Energy (Kcal/kg)	2700	2600	2600	2600	2400
Crude Protein %	20	18	16	20	15
Lysine %	1	0.8	0.7	0.9	0.63
Methionine %	0.45	0.4	0.35	0.4	0.25
Methionine + Cystine %	0.75	0.7	0.60	0.76	0.46
Tryptophan %	0.17	0.15	0.13	0.18	0.12
Threonine %	0.50	0.48	0.42	0.60	0.38
Calcium % (min)	1.5	1.5	1.5	2.5	1.6
Total phosphorus %	0.55	0.5	0.4	0.4	0.4
Available phosphorus %	0.55	0.5	0.4	0.4	0.4
Sodium chloride %	0.4	0.3	0.3	0.4	0.3
Crude Fiber (max) %	9	10	10	10	10
Vitamin A (IU/kg)	15000	8800	8800	15000	8800
Vitamin D (IU/kg)	4500	3300	3300	4500	3300
Vitamin E (IU/kg)	100	44	44	100	44
Vitamin B_{12} (µg/kg)	45	22	22	45	22
Choline (mg/kg)	2200	2200	2200	2200	2200
Copper (mg/kg)	30	33	33	30	33
Zinc (mg/kg)	110	110	110	110	110
Manganese (mg/kg)	150	154	154	150	154
Iodine (mg/kg)	1.1	1.1	1.1	1.1	1.1

Starter: 0-14 week age or up to 10 kg body weight, Grower: 15-34 week age or 10-25 kg body weight, Finisher: 35 week age to slaughter or 25 to 40 kg body weight, Breeder: 4-5 week before breeding,

Ingredient in emu feed:

Nutrient requirement	Starter	Grower	Finisher	Breeder	Maintenance
Maize	50	45	60	50	40
Soyabean meal	30	25	20	25	25
DORB	10	16.25	16.25	15.50	16.30
Sunflower	6.15	10	0	0	15
Dicalcium phosphate	1.5	1.5	1.5	1.5	1.5
Calcite powder	1.5	1.5	1.5	1.5	1.5
Shell grit	0	0	0	6	0
Salt	0.3	0.3	0.3	0.3	0.3
Trace minerals	0.1	0.1	0.1	0.1	0.1
Vitamins	0.1	0.1	0.1	0.1	0.1
Coccidiostat	0.05	0.05	0.05	0	0
Methionine	0.25	0.15	0.25	0.25	0.15
Choline chloride	0.05	0.05	0.05	0.05	0.05

First egg is laid around two and half year age. Eggs will be laid during October to February particularly cooler days of the year. The time of egg laying is around 5:30 PM to 7:00PM. Eggs can be collected twice daily to avoid damage in the pen. Normally a hen lays about 15 eggs during first year cycle in subsequent years the egg production increases till it can reach about 30-40 eggs. On an average, a hen lays 25 eggs per year. Egg appears to be varies from light, medium to dark green. The surface varies from rough to smooth. Majority of eggs are medium green with rough surface. Feed the breeder ration with sufficient calcium (2.7%) for ensuring proper calcification of egg with strength. Feeding excess calcium to the breeding bird before laying will upset the egg production and impairs the male fertility. Provide extra calcium in the form of grit or calcium powder by placing in a separate trough. Collect eggs frequently from the pen. If eggs are soiled, clean with sand paper and mop up with cotton. Store the eggs in a cooler room providing 60°F.

Incubation and Hatching: The correct incubating temperature i.e. dry bulb temperature about 96-97°F and wet bulb temperature about 78-80°F (about 30-40% Relative Humidity). Fumigate the incubator with 20gm Potassium Permanganate + 40ml Formalin for every 100 cubic feet of incubator space. Turn the eggs every one hour till the 48th day of incubation. From 49th day onwards stop turning the eggs and watch for pipping. By 52nd day, the incubation period ends. Hold the chicks for at least 24 to 72 hours in the hatcher compartment for reducing the down and to become healthy chicks. Normally hatchability will be 70% or more.

Different use of Emu rearing:

Egg: The average emu has weight of 600 to 800 gm. Average length and width are about 130 mm and 87 mm respectively. Emu eggs have a pleasant taste.

Emu Meat: Emu meat is a delicious dark red meat. The meat is lean, tender and exquisitely flavoured. Emu meat, especially thigh muscle, is an excellent alternative for health conscious consumers who love the taste of beef. It is richer in protein, iron, selenium, thiamine, niacin, riboflavin, vitamin C, pyridoxine and cyanocobalamine. The fat is 45%

monounsaturated which lowers the LDL cholesterol. At the age of 1 year, the slaughter weight of an Emu is about 20-22 kg.

Emu Oil: Emu oil is derived from the fat layer that is deposited on the upper back of the birds. Each emu produces a different quantity of this fat, depending on its age, nourishment, environment condition, genetics, stress levels and other factors. According to processors, an Emu weighing 40-50 kg can be expected to yield 7.5-10 kg of fat, equating roughly into 5-6 liters of rendered oil. From a one year old emu, 3-5 litres of oil may be gained. Emu oil naturally contains a high level of linoleic acid, a substance known to ease arthritic pain. This coupled with its ability to penetrate quickly and deeply, which explain its effectiveness. Emu oil has been found to be effective on burns of all types from sun burns to first and second degree burns, readily alleviating the pain and dramatically reducing the scarring and blistering. Emu oil has long used in cosmetics industry as a skin moisturizer (to reduce the effects of harsh sun and ageing of the skin) and other products like shampoos, lip-balms, soaps, body shampoos, cologne etc. It is also used for combating bursitis, insect bites, eczema, cold sore, psoriasis etc.

Emu leather: The emu leather is used in products such as boots, belts, hand bags, wallets, garments and accessory items. Approximately 8 square feet of hide may be obtained from an adult emu birds.

Emu feather: Emu feather is attractive. They are also used for manufacturing feather duster, feather pads, fans, boas, masks and in the arena for finishing metals prior to painting.

Emu infertile eggs: The green coloured shells of the infertile eggs are used to make attractive painted and carved ornaments. Egg shell artists transform these shells into works of arts such as music boxes, intricate miniature scenes etc.

Emu toe-nails: Toe nails are polished, finished and designed in different ways to be used as various jewelry pieces for women.

Management of Emu at different stages: The emu survives on a simple diet and tries to drink once or twice a day. Drinking water2-4 gallons/day is required. They also play in water and mud. An adult bird consumes 2 pounds of feed a day, consisting of mixture of Alfa alfa, Corn, Oat, Soyabean and Wheat. Though nutrient requirement of the emu is not yet established, it is easy to feed them. In general, emu feed contains the following ingredients: Lupins, Oats, Fish meal, Meat and bone meal, vitamins and minerals. Commercial chicken starter may be used for emu chick feeding. Birds are slaughtered at 12-15 months of age and can be finished to maximum fatness at 8 to 10 weeks by feeding a low protein and high energy ration. Breeders are fed on chicken layer type ration fortified with different vitamins and minerals. Feed conversion is not yet balanced and standardized. Improved feeding will give better performance.

Housing Facilities: The farm area is fenced and subdivided into paddocks like ostrich paddock. Stocks are difficult to handle, transport and move between pens. The stocking density rate is low. This kind of husbandry keeps the labour cost low.

Health care: Ratite birds are generally sturdy and live long (80% livability). Mortality and health problems in Emu are mainly in chicks and juveniles. These include Starvation, Malnutrition, Intestinal obstruction, Leg abnormalities, Coli infection and Clostridial infection. The main causes were improper brooding or nutrition, stress, improper handling and genetic disorders. Other diseases reported were Rhinitis, Candidiasis, Salmonellosis, Aspergillosis, Coccidiosis, Lice and Ascarid infestations. Ivermectin can be given to prevent external and internal worms at 1 month interval beginning at 1 month age.

In Emu, Enteritis and viral eastern equine encephalomyelitis (EEE) were reported. In India so far few outbreaks of Ranikhet disease were reported based on gross lesions but were not confirmed. However, the birds vaccinated for R.D. at the age of 1st week (Lasota), 4 week (Lasota booster), 8th, 15th and 40th week by Mukteshwar strain gave better immunity.

BROILER LIFTING RATES FOR THE MONTH OF OCTOBER 2021

place	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Hyderabad	126	118	123	125	127	127	127	127	127	127	127	117	107	109	114	122	128	128	128	128	120	115	110	112	112	112	105	105	100	100	105
Karimnagar	126	118	123	125	127	127	127	127	127	127	127	117	107	109	114	122	128	128	128	128	120	115	110	112	112	112	105	105	100	100	105
Warangal	126	118	123	125	127	127	127	127	127	127	127	117	107	109	114	122	128	128	128	128	120	115	110	112	112	112	105	105	100	100	105
Mahaboobnagar	126	118	123	125	127	127	127	127	127	127	127	117	107	109	114	122	128	128	128	128	120	115	110	112	112	112	105	105	100	100	105
Kurnool	126	118	123	125	127	127	127	127	127	127	127	117	107	109	114	122	128	128	128	128	120	115	110	112	112	112	105	105	100	100	105
Vizag	116	116	118	120	122	122	122	122	122	122	122	112	107	109	114	122	128	128	128	128	120	115	112	114	114	114	107	107	102	102	105
Godavari	120	120	125	127	129	129	129	129	129	129	129	119	109	111	116	124	130	130	130	130	122	117	114	116	116	116	109	109	104	104	109
Vijayawada	120	120	125	127	129	129	129	129	129	129	129	119	109	111	116	124	130	130	130	130	122	117	114	116	116	116	109	109	104	104	109
Guntur	123	122	127	129	131	131	131	131	131	131	131	121	109	111	116	124	130	130	130	130	122	117	114	116	116	116	109	109	104	104	111
Ongole	123	122	127	129	131	131	131	131	131	131	131	121	109	111	116	124	130	130	130	130	122	117	114	116	116	116	109	109	104	104	111
Chittor	132	124	131	131	133	127	127	127	127	129	121	110	110	105	110	117	122	122	124	124	124	112	114	117	117	117	107	102	92	97	104
Nellore	132	124	131	131	13	127	127	127	127	129	121	110	110	105	110	117	122	122	124	124	124	112	114	117	117	117	107	102	92	97	104
Namakkal	119	119	121	121	121	121	121	114	114	108	108	102	102	94	96	102	107	107	107	107	107	90	92	95	95	95	88	84	78	81	87

Mr. K.G.Anand visits The Advanced Nutrition Lab at Hyderabad

Recently, Mr. K.G.Anand - General Manager Venkateshwara Hatcheries Pvt. Ltd., visited The Advanced Nutrition Lab set up by Uttara Impex Pvt. Ltd. (UIPL) at Hyderabad. He was greatly impressed with the advanced equipments as well as with the array of tests conducted at the lab. He said, "I deeply appreciate the efforts by UIPL to help poultry farmers analyze the nutritional value of the raw material and poultry feed through the services provided by this lab. It will help the farmers immensely."

Praneeth Rao, Director, Uttara Impex Pvt. Ltd. said, "The Advanced Nutrition Lab has made the NIR Calibrations robust by taking support of Poultry Diagnostic and Research Center, Pune and ADISSEO France. The lab supports farmers by providing Total and Digestible Amino Acids of Feed ingredients by making formulations and thereby nutrition, precise and accurate. The lab is equipped with latest Mycotoxin analyzer which gives quick and accurate analyses of major toxins."

The importance of proper analysis of raw material has been increasing day by day in the Indian Poultry industry. Farmers want to understand the value of raw material in terms of AME, amino acid profile, TPP, TDAA which helps to increase bird performance. Earlier poultry farmers gave samples for proximate analysis only to 2-3 labs to ensure accuracy of analysis. Now it is possible to get accurate analysis report with additional AME, TPP, Amino acid profile from Uttara Impex - The Advanced Nutrition Lab.

The laboratory is equipped with an Advanced Transform Near-Infrared Spectroscopy (FT-NIR) machine. FT- NIR is a non-destructive chemical analysis technology, which is a means of identifying and analyzing various raw materials. FT-NIR systems have certain advantages like higher resolution, better wavelength accuracy, higher signal energy, stability, real time analysis and repeatability. FT- NIR conducts tests like Amino Acid Profile, Apparent Metabolizable Energy (AME), Total Phytic & Available Phosphorus (TPP), Total & Standardized Ileal Digestible Amino Acids (TDAA) and provides Proximate Analysis of Raw Material

At present, the lab is receiving samples from across India on a regular basis. The raw material is tested with the following three methods to ensure an accurate analysis report-

- ADISSEO PNE services
- Venky's Indian Calibration and
- Wet chemistry

With the support of PDRC Pune, the lab has designed a robust NIR calibration for proximate analysis. This calibration is purely based on Indian raw material. After several years of testing and research this calibration provides perfect results. Making use of this calibration it

is possible to provide accurate results within minutes. Facilities like wet chemistry is also available at The Advanced Nutrition Lab where samples are analysed through advanced digital equipment's like Toxin Analyser, Digital Buretee, Magnetic Stirrer, Muffle Furnace, Hot air Oven and Advanced Protein Analyser amongst many others. The lab undertakes tests such as Crude Fiber, T2/HT-2 Toxin, Zearalenone, Soluble Protein, Thirum, Sand & Silica, Total Phosphorus etc. Oil analysis is also available here. Accurate report and on-time analysis has definitely helped farmers to trust the lab

Benefits

- Higher accuracy due to Indian calibration, Wet Chemistry and ADISSEO Precise Nutrition Evaluation (PNE) services
- Highly experienced technical staff
- Advanced equipments help in accurate analysis report
- On-time analysis report

Tests Conducted At The Lab

Amino Acid Profile	Moisture	Calcium	Thirum
Apparent Metabolisable	Crude Protein	Magnesium	Aflatoxin
Energy [AME]	Crude Fat	Salt	Ochratoxin
Total Phytic & Available	Crude Fiber	Soluble Protein	T2 / HT-2 Toxin
Phosphorous [TPP]	Total Ash	Urease Activity	Zearalenone
Total & Standardised Ileal	Sand & Silica		
Digestible Amino Acids	Total Phosphorus		
[TDAA]			

Contact Details:
Mr.Shankar Reddy: **8008802148** / Mr.Vijay Kumar: **8008101670**

UTTARA IMPEX PVT. LTD.

The Advanced Nutrition Lab, BSR Arcade, Door No. 4-3-109/33, Sri Sai Colony Phase II, Old Highway, Hayathnagar, Hyderabad R.R. Dist- 501505.

PRESS RELEASE

SUGUNA FOODS
Breeding Trust, Growing Together

Suguna Foods launches its range of Layer chicken feed in Bihar

Mumbai,22nd November, 2021: Suguna Foods,one of the leading poultry companies in the country has launched'Layer chicken feed' in Bihar.

Layer chickens, are a breed of hens having a significantly enhanced capacity for producingeggs from 18-19 weeks of age and continue till 80 weeks and above.

The conglomerate has launched 4 types of Layer feed, each designed to be given to the hens at various stages during the bird's life cycle.

Layer Chick Crumble feed is recommended from 0- 8 weeks which helps in gut development and strives to improve growth rate, weight gain and enhances the immunity of the flock. This highly nutritive formulation aims to reduce early chick mortality (ECM) and consequently improves the livability of the flock.

Layer Grower Crumble feed is recommended from 9 – 17 weeks. It helps to maintain the skeletal body frame and organs development. This nutritious feed has been meticulously formulated to reduce pullet mortality and ensure flock uniformity.

Layer Crumble feed has been formulated for two phases, based on stage of the birds. Phase 1 is recommended between 18- 52 weeks while Phase 2 can be used from 53 weeks onwards. At both the stages, this wholesome feed aids in maintaining peak egg production and helps in achieving optimum egg weight and ensure strong egg shells.

Commenting on the launch **Suguna Foods** said, "Suguna Feeds takes immense pride to extend their nationwide operations by launching their Layer feed range inBihar. With a strong & proficient team of expert poultry nutritionists & veterinary experts working round the clock to provide best feed for

layer birds during various stages of life, the company assures in delivering premium quality feed at affordable rates to satisfy the needs of commercial layer farmers across the nation." He added, "Through the complete range of highly nutritious layer feeds, Suguna Feeds is confident in helping farmers to accomplish the performance goals of layers at every stage of life. With the intervention of the Bihar government's Department of Animal & Fisheries Resources in providing incentives and subsidies for the welfare of poultry farmers, the growth rate of the poultry sector in Bihar sounds highly promising."

For enquiries, please contact 1800 104 4343; Customercare@sugunafoods.com

About Suguna Foods:

Suguna is one of the top ten poultry companies in the world. It operates in 18 Indian states and offering a range of poultry products and services. Broiler and layer farming, hatcheries, feed mills, manufacturing plants, vaccines, and exports are all part of the fully integrated operations. Suguna supplies frozen chicken, value-added eggs, and live broiler chicken. Suguna has developed a chain of modern retail outlets with the aim of providing customers with fresh, safe, and hygienic packed chicken. Suguna foods' popular product lines include Suguna Daily Fresh, Suguna Home Bites, Suguna Anytime processed chicken, and four types of specialty Suguna value added eggs.

Multiple Mycotoxinsand the Indian Poultry Industry

Dr S.K.Maini, Vesper Group, Bengaluru.

Mycotoxins are the secondary metabolites of a variety of fungi like the Fusarium, Penicillium, Aspergillus etc. Fungi grow's on the crops in the field and on grains in storage. The spectrum of mycotoxins produced depends on **physical factors** (moisture, relative humidity, temperature) and **chemical factors** (oxygen, carbon dioxide, and composition of the substrate). **Moisture** and **temperature** are the major factors influencing mould growth and mycotoxin production. Some fungi are capable of producing a variety of mycotoxins.

Some Fungi and the mycotoxins they produce

Fungal species	Mycotoxin Produced
Aspergillusparasiticus	Aflatoxins B1, B2, G1, G2
A. flavus	Aflatoxins B1, B2
Fusariumgraminearum	F. roseum, Deoxynivalenol, Zearalelone
F. moniliforme	Fumonisin B1
F. Sporotrichioides	T2-toxin, HT-2 toxin,
Penicilliumverrucosum	F. poae, F. tricintum, Ochratoxin A
Aspergillusochraceous	A. paraciticus,
A. niger	Ochratoxin A

More than **400 different types of mycotoxinsare produced by nearly 350 species of fungi, these can be found in the literature, and normally tests are performed for the following few -** Aflatoxins**,**Ochratoxins -A, DON, HT-2 or T-2-toxin, Fumonisin, and Zearalenone.

Multiple mycotoxicosis or mycotoxinco-contamination with various types of simultaneously occurring mycotoxins is a major problem of the Indian Poultry Industry, that slowly and steadily alters the birds metabolism, suppresses the immune system, damages the liver, kidneys, intestines and changes the blood parameters, complicating the situation, making it difficult to diagnose, control and treat.

Confusion prevails and Guess work fails, non-specific symptoms make it difficult to address the situation properly before much of the damage is done, then begins the blame game, and few Veterinarians and Marketing personnel of Pharma Companies take advantage of the situation to promote their products vaccines fail to protect infections, antibiotics don't control the bacterial diseases, egg production reduces, body weights are depressed, farmer's loose heavily due to treatment cost and the reduced performance.

No single Toxin Binder, can totally prevent, control and treat this condition.Non of the toxin binders normally used in poultry feeds will check/ reverse or control Chemical toxicity of feeds.

Multiple mycotoxins can generate additive or synergistic effect, interfere in nutrients digestion, absorption, assimilation and metabolism, cause damage to the Intestinal tract, disturb the normal microbiota of the intestine, all causing negative impact on the birds performance.

In a recent survey of the Mycotoxins Prevalence in India, it is reported that, 88 % of the samples were contaminated with more than one type of mycotoxin, and 24 % had contamination with more than 4 types of mycotoxins.

Different physical, chemical, and biological methods to prevent mycotoxicosis in poultry feeds have been reported but practical and costeffective methods for efficiently decontaminating multiple mycotoxins containing feedstuffs are currently not available.

T-2 toxin is the most potent toxin of the trichothecene family, inhibits the DNA, RNA synthesis, cause neural disturbances, cytotoxicity and disturbances in the skin, intestine, liver and kidneys, and severe immunosuppression. There are about 190 different types of T-2 toxins with the same basic chemical structure, but will need different detoxifying agents for their control, depending upon their concentration.

Potential mycotixin absorbent materials include activated carbon, aluminosilicates (clay, bentonite, montmorillonite, zeolite, phyllosilicates, etc.), complex indigestible carbohydrates (cellulose, polysaccharides) the cell walls of yeast and bacteria such as glucomannans (MoS&FoS), peptidoglycans, enzymatic degraders or digestors, and synthetic polymers such as cholestryamine and polyvinyl pyrrolidone and their derivatives.

Research on fungi and mycotoxins, various laboratories have tested more than 300 different materials e.g. organic binders, cellular components, aluminosilicates, activated carbon, etc. for their ability to bind mycotoxins.

The best strategy will be to use a combination of an anti fungal agent to control the growth of fungi, an absorber, an enzymatic degrader, a probiotic type of pH regulator and activated char coal as an adsorber to check the growth of fungi and production of mycotoxins, in combination with a product to protect the Intestines, liver, kidneys and to regulate the metabolic activity in the birds body, together all the above will ensure good health and performance.

PRESS RELEASE

"India's poultry industry must invest"

- Ricky Thaper

Ricky Thaper

India's poultry industry must invest in faster adoption of automation in brining efficiency in the poultry production besides improving infrastructure at the marketing points for ensuring that hygienic products are supplied to consumers - Ricky Thaper, Treasurer, Poultry Federation of India.

India's poultry sector, despite the challenging times of 2020 and 2021, has been one of the fastest growing segments of Indian agriculture and allied sector. In fact, while the agricultural production has been growing at around two percent, in the last decade, the production of eggs and broilers has been rising in the range of around eight to ten percent on an annual basis. The Poultry sector especially is growing at a compounded annual growth rate (CAGR) at a constant 10.5% and playing critical role in promoting livelihood options in the rural economy. Due to this steady growth, India has emerged as the world's third largest egg producer and sixth largest producer of broiler meat. Economic growth, rise in urbanization and stress on consumption of protein rich food have contributed to steady growth in demand for poultry meat and eggs.

Despite several field and raw material rates challenges, the business-to-consumer demand for poultry remains good. Consumers are looking for additional sources of protein rich foods and poultry meat is preferred over other meat products as it is considered more hygienic and supplies are uninterrupted throughout the year in relatively economical prices compared to prices of mutton and fish. According to Basic Animal Husbandry Statistics, 2020, India's poultry meat production was 4.34 million tonnes, contributing more than 50% of the total meat production in 2019-20. The egg production stood at 114.38 billion in 2019-20.

According to the National Action Plan for egg and poultry – 2022 prepared by Department of Animal Husbandry, Dairying and Fisheries, more than 80 percent of India's poultry output is produced by organized commercial farms. Major poultry companies have vertically integrated operations which comprise approximately 60-70 percent of the total poultry meat production.

The broiler meat industry is witnessing growth because of adoption of the backward integration system. The companies, which are integrators, have hatcheries, feed mills, and primary processing facilities. The integration model ensures that farmers (who own farms with 5000 – 10,000 broilers capacity) are insulated against fluctuations in market prices as under the contract they remain assured of getting predetermined fixed prices. Directly and indirectly this poultry sector provides employment to around six million small and medium farmers

However, for meeting rising demand for poultry products in the coming years, the poultry farmers need to adopt automation for ensuring efficient production system and improving infrastructure at the existing wet market. A large chunk of the broiler and layer farms in India do not have climate control system, which exposes the broilers or layers to various climate changes, which could adversely impact productivity. Latest farming technologies such as climate-controlled farm houses, automated feeding lines etc. can help improve the productivity in farms. Feeding, water supply, temperature and humidity control are some of the variables that require automation in poultry farming.

With rising cost of labour as well as reduction in supplies of workforce in parts of the country, the automation at farm level has to be installed for bringing in efficiency in the production at broilers and layers farms. According to industry sources, automatic feeding system could reduce the labour cost and improve farming level and Feed Conversion Ratio (FCR) efficiency.. With automation, FCR is bound to improve further thus making India's poultry

meat production more efficient. The broiler and layer farmers usually refer to feed costs as the critical component of controlling and lowering production costs.

There has been gradual adoption of environmentally controlled (EC) sheds by commercial broiler farmers. The EC sheds ensure bigger harvests, better feed conversion and economy both on capital and revenue investments. Keeping air and floor temperature in the house fully under regulation are essential during brooding. Some of the elements of EC sheds include temperature and humidity maintenance, supplementary levels of heating and cooling at all times, increase of biomass in the shed and floors are prepared for keeping the even heat distribution.

The Commercial production of eggs and chicken meat on scientific principles has been well standardized, while the marketing system of eggs and broiler meat are not fully organized. Eggs are sold mostly from retailer next door for meeting the daily needs of consumers. Eggs go through the value chain of wholesale dealers, sub-dealers, retailers etc.

Broilers are sold live or slaughtered openly in the live market and according estimates around 90% of broiler meat is sold through wet market. There is need for creating infrastructure for hygienic slaughter. There is need for investment in improving marketing infrastructure for both broiler birds and eggs for attracting more health-conscious consumers especially in the post-COVID phase. Hence, there is a need for setting up of broiler meat processing plants in the near future and sale of processed chicken to increase both to cater domestic as well as export markets.

The demand supply situations witness significant seasonal fluctuation in broiler and eggs prices. The prices as well as demand mostly decline during religious festivals. The major industry players attempt to support prices by reducing chick placements when demand falls. However, the industry needs to put in place robust market information in advances by assessing demand pattern.

The demand for poultry and processed poultry products has seen an expansion especially since middle of 2020. There has been huge increase in e-commerce with expansion of home delivery as a response to COVID-19 lockdowns and the fear of exposure by shopping in traditional wet markets.

The online segment is expected to continue to drive broiler and eggs consumption in the coming years thus by pushing increasing per capita consumption of poultry meat and eggs.

Recently the Government had announced Special Livestock sector package amounting to Rs.9,800 crore over the next five years starting 2021-22. The poultry meat as well as egg sectors must take advantage of this financial assistance to boost infrastructure. A capital subsidy should be there on setting up EC sheds with improvement in infrastructure in the wet market that would boost demand as well as consumption.

Feeding and Nutrition of poultry

B.K. Ojha, **Sankhanath Koley** and **Abhilasha Singh**, Department of Animal Nutrition
College of Veterinary Science and Animal Husbandry, Kuthulia, Rewa- 486001, Madhya Pradesh, India
(Nanaji Deshmukh Veterinary Science University, Jabalpur, M.P.)

The term Poultry includes bird rear for economic gain like chickens, ducks, ostrich, emus, quails and turkeys.

Feeding of chickens

The following information is needed for feed formulation

1. Nutrient requirement
2. Information of feed ingredients

Nutrient requirements

The chickens are reared for meat productions are called broilers and chickens are reared for egg productions are called layers. The nutrient requirements on chicken depend upon the species breeds its genetic make up, age, production, status and environmental condition. The latest feeding standard available for chickens feeding are:-

1. Poultry nutrient requirement by bureau of Indian standard (BIS) 1992
2. Nutrient requirements of poultry by national research council USA (NRC)1994
3. Nutritional requirement of poultry by agriculture research council UK (ARC)

The accurate way to express the nutrient requirement is gram per kg of live weight, but in case of poultry group feeding is done so the nutrient requirement is expressed in terms of percent or per kg of ration, the CP requirement is expressed as CP percentage and energy expressed as ME kilo calorie /per kg of ration. In birds the unit of energy is kilo calorie or mega calorie or joule or mega joules .the type of energy express is ME in words because it is easier to estimate the losses of energy through faeces and urine in combination. The reason is that there is a common opening for faecal and urinary losses called as cloaca and it is difficult to separately estimate the faecal losses only.

In chickens are generally are reared for egg and meat production so the nutrient requirements are different. The chickens which are reared for meat production are called broilers and chickens are reared for egg production are called layers

Nutrient requirements of broilers

Broilers are the specialised types of birds which are grown for meat production the broiler strains have been developed by selective breeding of soft growing birds having a tender soft meat fast growth rate higher feed conversion efficiency , they are reared for table purpose their production is more profitable. They are ready for slaughter after the 5 week age. Depending upon the growth rate the feeding of broiler is divided into two phases

1. Broiler starter 0-5 weeks period
2. Broiler finisher phase 5-8 weeks

Broiler starter phase the growth is very fast so the nutrients requirements is more they require 23% CP where in broiler finisher stage the growth is comparatively less and thus they require less protein 21%CP. The energy requirements for broiler starter are 2900 Kcal ME per kg of ration, where as for broiler finisher is 3000Kcal of ME per kg of ration is required.

The maximum CF % should not be more than 6%, the acid soluble ash should not be more than 3% and salt should not be more than 0.6 % and moisture content should not be more than 10%. The acid soluble ash when increase 1% it decrees the digestibility 4%. In broiler the calcium requirements is 1.2% of ration.

Nutrient requirements of layers

Layers are the birds which are reared for egg production these are the birds which have selectively breed for higher egg production (Normally 300 egg/ year). These birds are not reared for meat production and their growth is not very fast, thus requirements of protein and energy are comparatively lower then broiler the feeding of layer is generally done in three phases.

1. Starter chick (0-8 week)
2. Grower chick (8-20 week)
3. Layer (above 20 week)

The nutrients requirements during different phases are as follow.

Starter chick- during this phase protein should be 20% CP and energy requirements is 2600 Kcal /kg ration. The CF should not more than 7%, the acid soluble ash is not more than 4% and salt should more than 0.6% of ration

Grower chick - during this period CP% is reduced to 16% because this phase the growth is steady lower as compare to starter phase. The feed intake also increase thus the protein % is smaller or lesser then starter phase. The energy requirements during starter and grower phase is not different it is 2500-2600 Kcal of ME /kg of ration. The CF should not more than 8%, the acid soluble ash is not more than 4% and salt should more than 0.6% of ration. The moisture content should not be more than 11%, if it is more then it then the fungus growth is there on feed and quality of feed is decrees, also the feed intake will reduce

- In poultry quality of feed decides the rate of feed; depend on moisture % CF% and acid soluble ash%.

Layers - at the 5 month of age the birds starts lying. In initial stage the size of egg is smaller and the production is less. As the laying continues gradually the size and production increase. Generally it is consider that the layer have 300 egg per year production with average egg weight should be 50 gram.

In layer feed the CP% should be 18% and energy should be 2600 Kcal of ME /kg of ration. The CF should not more than 8%, the acid soluble ash is not more than 4% and salt should more than 0.6% of ration. The most important difference between broiler and layer respect to nutrient requirements is layer required 3% calcium.

- Each egg contains 2 gram calcium and efficiency of utilization of digestive system is 50% so for two gram the requirement is 4 gram in diet. The egg production 80% (300 egg /year) so the calcium requirements is 3.2 gram per day. Layer consume 110 gram feed daily, if it contain 3% calcium it will full fill the 3.2 gram requirements of egg production.
- Calcium is present in egg shell in the form of $CaCo_3$

Nutrient requirements for breeder

Effect of diet on egg hatchability

Hatchability is markly influenced by the composition of diet. The layer which are kept for breeding purpose must be supplied with a adequate ration consuming optimum CP and energy which are required by the layers in addition the conc. of some nutrients must be higher these are Mn, Fe, Zn, Cu, Vit E and B6 these play important role fertility and hatchability of the egg. The breeder birds should on low energy ration to avoid excessive fat deposition around the reproductive organs. The quality of protein is also very important for breeder birds.

Essential fatty acid (leinolic acid) is essential in the diet of breeder hens for the normal hatchability of egg.

- Riboflavin deficiency result in poor hatchability and cubed down embryo
- Biotin deficiency is reflected in parrot beaks
- Pantothenic acid deficiency shows unhatched embryo showing subcutaneous haemorrhage

- Thymine deficiency may result to early embryonic death high incidence of embryonic deformities
- Folic acid deficiency also leads to death of embryo during incubation
- Vitamin A, E, B12 are needed in proper amount to avoid early embryo mortality at around 2, 1-3 and 8-14 days respectively.

Mineral elements are essential for the development of embryo hence deficiency of minerals like Ca, P, Mn, Zn, Mg, Fe, Cu, Iodine, Mo and Se causes embryonic mortality and abnormalities. Similarly excess of Ca, P, and Se are also causes undesirable and depress hatchability.

Magnesium deficiency results in to condition known as nutritional chondrodystrophy or parrot beaks. This deficiency causes mortality of embryo around 18-21 days of incubation.

In case of Zn deficiency absence of legs and wings are observed in the embryo and feather down may appear tufted.

Amino acid requirement for poultry

The total protein requirement can be satisfied easily ,but in monogastric animal protein nutrition is actually amino acid nutrition so it is more imp to satisfied the requirement of amino acid rather tha the satisfying crude protein percentage .

There are generally ten essential amino acid for rate in poultry glycine and argentine rare additionally requires .Glycine is required because end product of metabolism of protein in bird is uric acid is not urea and biosynthesis of uric acid glycine is required. Glycine may be synthesised from keratin and serine as long as vitamin B12, folic acid and pyridoxine is not deficient.

Argenine is for poultry because it yields urea and ornithine, ornithine very essential because along with glycine it is required for the detoxification of aromatic compound in the liver. Cysteine and tyrosine are semi essential because this amino acid can be obtained from methionine and phenyl alanine.

Limiting amino acid : Amino acids that are critical in the diet of poultry are arginine, threonine lysine methionine and tryptophan. Threonine tryptophan are only marginally deficient and careful selection of ingredient can avoid there deficiency. Argenine deficiency is not a problem if groundnut cake is used as ingredients.Lysine and methionine are the limiting amino acid in practical poultry diets, it is reported that methionine and lysine are first and second limiting amino acid in poultry ration.

The limiting amino acid concept may also be explained as follow the ratio between the amount of amino acid and its requirement gives an idea, the lowest ratio give the first limiting amino acid ,the next lowest ratio give the second most amino acid it has been reported that for poultry methionine is the only limiting amino acid in soya bean meal diets and if the diet contains sesame cake lysine is first limiting amino acid.

Lysine requirement as percentage of protein is less for egg production then for growth and deficiency in diet for egg production is not usual.

In general all the amino acid must be present in the diet at the same time for their efficient utilization, the needed amino acid can be supplemented in the practical diet. Synthetic L- lysine and D-L methionine are supplemented in the diet to make the diet animal protein free. Synthetic L- lysine and D-L methionine are available commercially at the reasonable price for poultry ration.

Amino acid toxicity

Methionine is the most growth repressing when add at 40 gm per kg diet , excess methionine depress the growth of chicks, excess of amino acid are also harmful because on excess amino acid may create an increased demand for another one for example toxicity of dietary lysine is overcome by increasing the level of argenine or glycine ,threonine eliminate the toxic effect of tryptophan, glycine reduce the toxic effect of methionine ,similarly the toxic effect of an excess luecine or

valine are removed by isoleucine these are established interaction between amino acid and must be remembered when formulation the ration. Although the moderate excess may be allowed because it is not harmful.

Factors affecting amino acid requirement

1. Energy contents of diet - as the energy contents of diet increases the requirement of all the essential amino acid.
2. Content of polyunsaturated fat – because polyunsaturated fat upon peroxidation produce aldehydes which may bind lysine and thus make it unavailable.
3. Raw soybean causes hypertrophy of pancreas due to which there is more production of trypsinogen which is rich in methionine thus methionine requirement increases

Calorie protein ratio

It is defined as ME kcal /kg ration divided by % of CP in the ration. the ratio value varies with the age of birds calories protein ratio for BIS requirements are as fallow.

1. Broiler starter feed -122
2. Broiler finisher feed-145
3. Chick starter feed-130
4. Grower feed-154
5. Layer feed-144

The calorie protein ratio is very important in all the animals for efficient utilization of feed. The important factor is as the energy density increase the intake of feed decrees and thus the CP % should we in the diet otherwise the animal will suffer from protein deficiency because of this reason while expressing the feeding standard along with energy and CP the calorie protein ratio should also be stated.

PRESS RELEASE

Mr. K K DWIVEDI as their new Zonal Sales

The Management of **SYLON** Group of Companies announces the induction of **Mr. K K DWIVEDI** as their new Zonal Sales Manager (Marketing). He will be responsible for marketing activities of the group and developing marketing Strategy plans and implementing the same in NORTH & EASTERN ZONE AND NEPAL with LUCKNOW Head Quarters.

Mr. K K DWIVEDI

Further following Business Manager Vacancies are existing in the Group.

NAMAKKAL / PALLADAM / BANGALORE/ CHANDIGHARH/ PATNA/ KOLKATA

Interested Candidates Can Apply to admin@sylon.in

Mobile Number: 9391559921, 86888 93389.

He got 30 years of experience in Poultry industry and served earlier in Alembic/IBC/Interface at various levels, all team members of North & Eastern Zone will report to him.

According to the group Managing Director S. Shyam Sunder.

BIO-BUSTER+

The power of regeneration chemistry

Venworld

THE BEST IN ANIMAL HEALTHCARE

24x7 Surveillance for Better Protection!

Disease challenges from air & water borne pathogens are unpredictable, continuous protection is essential to fight them

Highly Versatile:
Surface, Equipment, Water & Aerial Disinfectant used even in presence of birds to reduce bio-burden during disease outbreaks

VENKATESHWARA B.V. BIOCORP

VENKATESHWARA B.V. BIOCORP PRIVATE LIMITED

(An ISO 9001:2015, OHSAS 18001:2007 & GMP Certified Company)
Venkateshwara House', S. No. 114/A/2, Pune-Sinhagad Road, Pune-411030
Tel.: (020) 24251803, Fax: +91-20-24251060/24251077, Website: www.venkateshwarabvbiocorp.com

nu▸start

Vitamin/Mineral Soluble Power

Profit Defender

NuStart is a concentrated water-dispersible nutritional supplement Of ***Essential Vitamins, Organic Trace Minerals*** with Built-in ***Acidifiers and Electrolytes***.

- Product from USA
- Best supportive solution for different type of ***Lameness, Stress & Immunity***
- Work as ***Nutritional Booster*** in readily available water soluble form
- Best in class ***Bioavailability***
- Helps to Improves Productivity
- Helps Chicks ***Livability and Growth***
- Work as tonic following multifactorial ***Infectious, Nutritional Deficiencies and Stress Factors***

FDA
MANUFACTURED IN A FDA - INSPECTED FACILITY

NuTech BioSciences,Inc.

Bhuvana

Distributed by:
NuTech Bio Sciences Pvt.Ltd.
07-17/3, (3rd Floor, Beside SunCity Nursing Home),
SunCity Mail Road, Bandlaguda, Hyderabad - 500 086
M : 8124840326

Manufactured by:
NuTech BioSciences Inc.
537 Fitch Street,
Oneida NY 13421. USA
www.nutechbiosciences.com. 315.505.6500

Marketed by:
Bhuvana Nutribio Sciences
E-7, 2nd Floor,Opp. Gate No. 1, Market Yard,
Glutekadi, Pune - 411037. (India)
M : +91 9850979652, 9396686500

Better Nutrition Through Biotechnologies

Biomin®

BIOMIN Mycotoxin Survey Q3 2021 Results

This is a review of the occurrence of major mycotoxins between January and September 2021. In total, 76,300 analyses were conducted on 16,164 finished feed and raw commodity samples originating from 74 countries.

Asia Pacific

Risk is extreme in South Asia, China and Taiwan. In Southeast Asia and East Asia risk is severe. Compared to the same time period last year (January-September 2020), abundance of Afla, ZEN, DON, FUM and T-2 stayed almost the same and is very high for FUM, DON, ZEN but also for Afla. Ochratoxin A (OTA) increased its prevalence from 17% to 23%.

Corn stays heavily affected with a very high abundance of *Fusarium* toxins (FUM 90%, DON 80%, ZEN 71%) and high average concentrations of these three mycotoxins (FUM 1,824 ppb; DON 1,041 ppb and ZEN 234 ppb). Co-occurrence is high: 94% of all samples contained more than one mycotoxin. In corn also Afla is a threat to animal health, as it is found in 26% of the sample at an average of 92 ppb.

While in China/ Taiwan and East Asia *Fusarium* toxins are the main concern, Aflatoxins are the second most prevalent mycotoxins found in all samples from Southeast Asia (58% with an average of positives of 32 ppb). In South Asia, Afla is the most abundant toxin detected in 79% of the samples (average 45 ppb), followed by OTA (72%) and FUM (70%).

In Oceania, risk of mycotoxin contamination continues to be moderate.

North America

Risk in North America stays severe with deoxynivalenol (DON) being one of the main concerns in all commodities. This mycotoxin was

present in 68% of all samples (average of positives 1,049 ppb).

Corn kernels are highly affected by DON and fumonisins (FUM). DON prevalence is 69% with a high average concentration of positive samples of 1,302 ppb. However, in corn, FUM has the highest prevalence (73%) and reaches an average concentration of 2,450 ppb. Average contamination level is also increased for zearalenone (ZEN) with 268 ppb and 32% prevalence 32%, as well as aflatoxin (Afla) (65 ppb), which is found less frequently (7%).

Finished feed samples also contain levels of *Fusarium* toxins that can be harmful for livestock. DON, FUM and ZEN are present in 81%, 64% and 29% of the samples, respectively. Levels are lower than in corn but still high: on average 846 ppb (DON), 1,840 ppb (FUM) and 162 ppb (ZEN).

Central America

In this region risk decreased slightly but is still severe. FUM and DON are most frequently found (in 73% and 68% of all samples, respectively). Average concentration in all positive samples found reaches 929 ppb for FUM and 409 ppb for DON. In corn from Central America, FUM is present in 95% of all samples and average levels are elevated (1,474 ppb), but a bit lower than in North America. Mexican corn seems to be more severely affected. FUM is found in almost all samples (94%) and the average concentration exceeds 2,000 ppb (with an extreme maximum found: 34,916 ppb).

South America

Risk in this region stays severe. *Fusarium* mycotoxins are the most prevalent, with FUM present in 66% of all samples, followed by DON (46%) and ZEN (40%). Aflatoxin was found in 28% of the samples (average of positives 7 ppb). Risk to livestock is mainly due to DON but also FUM concentrations. Corn shows high prevalence of FUM (83%, average of positives 1,618 ppb) and DON (47%, average of positives 519 ppb).

Interestingly in soybeans, the most prevalent mycotoxin found is ZEN (61%), followed by T-2, a trichothecene, (49%) and Afla (46%).

Europe

Risk in Europe ranges from moderate to high. The most prevalent mycotoxin is again DON (52%), followed by ZEN (46%) and FUM (40%). DON is the main threat to livestock, particularly for swine and poultry.

Highest levels of DON have been detected in wheat grains. In this commodity every second sample contained this mycotoxin at a high average of 1,147 ppb and a maximum concentration of 42,925 ppb. Concentrations are even higher in Central Europe (average of positives, concentration of DON is 1,557 ppb). These high levels are mainly due to samples from this year‘s harvest, which shows hot spots of

high contamination with DON in wheat and barley in some European countries. In Central Europe, all barley samples from January to September show presence of DON in almost every third sample at an average concentration of 629 ppb.

Middle East

The Middle East shows severe risk, mainly due to the high abundance of *Fusarium* toxins. Most abundant in all samples is FUM (90%), followed by ZEN (65%), DON (58%) but also Afla (27%). Risk to animal species is mainly due to DON and ZEN (average of positives 734 ppb and 110 ppb, respectively). Finished feed samples show a high co-contamination: all samples analyzed contained more than one mycotoxin.

Africa

In Sub-Saharan Africa, risk is severe. *Fusarium* mycotoxins are highly abundant: DON is present in 81% of the samples and thus increased in abundance compared to the same time period last year (January to September 2020: 75%). FUM is the second most prevalent mycotoxin, present in 51% of the samples, followed by ZEN in 44%. DON is the highest concern for livestock, average of positives is elevated with 548 ppb. Finished feed shows a high co-occurrence of different mycotoxins with 90% of the samples containing more than one mycotoxin.

South African corn shows particularly high abundance with DON in corn (90%, average of positives 607 ppb). Corn gluten samples from this region are heavily contaminated with DON, FUM and ZEN, all present in 100% of the samples. In this commodity DON reaches 1,483 ppb on average.

PRESS RELEASE

Alltech publishes white paper focused on organic trace minerals enhancingmineral bioavailability through chelation

Alltech has published a white paper entitled, "Organic Trace Minerals: Enhancing mineral bioavailability through chelation" by Dr. Richard Murphy, director of research at Alltech.

For more than 40 years, Alltech has focused on scientific research to provide solutions and products for the global animal health industry. This focus has continued with the publication of a white paper entitled, "Organic Trace Minerals: Enhancing mineral bioavailability through chelation" by Dr. Richard Murphy, director of research at Alltech. There are many options when it comes to formulating trace minerals in livestock diets, and this paper focuses on organic trace minerals (OTMs) as a more bioavailable mineral source than their inorganic counterparts and other inferior organic products.

"From a sustainability point of view, we can't continue to supplement diets with inorganic materials at the current very high inclusion levels without having negative consequences," said Murphy. "Our research with organic trace minerals is looking at using less to get more for the livestock producer and the environment."

OTMs can be produced through numerous mechanisms, depending on the trace mineral product being manufactured. The process of complexing or chelating elements, such as copper, iron or zinc, typically involves reacting inorganic mineral salts with a suitable bonding group, such as a peptide or amino acid, after which the mineral becomes part of a biologically stable structure. The higher the stability of an OTM, the greater its bioavailability is likely to be.

The chelation strength between the mineral and bonding group will define OTM stability and, ultimately, play a significant role in influencing bioavailability. Carefully considering the factors necessary for chelation can help producers distinguish between the many products available on the market based on their stability and efficacy. OTMs with high stability are more likely to be effectively absorbed by the animal and reach the target sites required for immunity, growth and reproduction. They are also significantly less likely to react with and inhibit the activity of other feed components, such as vitamins, enzymes and antioxidants.

For more information and to download the white paper, visit Alltech.com.

-Ends-

Contact: Dr. Manish Chaurasia, Marketing Manager, South Asia

mchaurasia@alltech.com; +91 8130890989

About Alltech:

Founded in 1980 by Irish entrepreneur and scientist Dr. Pearse Lyons, Alltech delivers smarter, more sustainable solutions for agriculture. Our products improve the health and performance of plants and animals, resulting in better nutrition for consumers and a decreased environmental impact.

We are a global leader in the animal health industry, producing additives, premix supplements, feed and complete feed. Strengthened by more than 40 years of scientific research, we carry forward a legacy of innovation and a unique culture that views challenges through an entrepreneurial lens.

Our more than 5,000 talented team members worldwide share our vision for a Planet of Plenty™. We believe agriculture has the greatest potential to shape the future of our planet, but it will take all of us working together, led by science, technology and a shared will to make a difference.

Alltech is a private, family-owned company, which allows us to adapt quickly to our customers' needs and maintain focus on advanced innovation. Headquartered just outside of Lexington, Kentucky, USA, Alltech has a strong presence in all regions of the world. For more information, visit alltech.com, or join the conversation on Facebook, Twitter and LinkedIn.

PRESS RELEASE

PF&BA (MH) Celebrates 'National Chicken Day'

PUNE: On the occasion of the **Birth Anniversary of Dr. BV Rao**, The Poultry Farmers & Breeders Association (MH) celebrated **'National Chicken Day' on November 16.** To mark this day, the chicken was sold at discounted prices across 50 chicken shops in Maharashtra.

Speaking during the event, President of PF&BA (MH) C.Vasanthkumar said, "Considering nutrition value of chicken, we need to eat chicken 5/6 days in a week. This will help to boost our immunity to fight against Covid-19.''

He further added that "Other state poultry associations like Karnataka Poultry Farmers Breeders Association, West Bengal Poultry Federation and many more state associations are celebrating 'National Chicken Day' today to create chicken awareness among the people.'' People should start eating chicken without any fear.

Distribution of chicken at 'Food Junction, Bhandarkar Road Pune' was inaugurated by President Mr. C Vasanthkumar. At that time, Mr. VinayKumar from Quality Poultry and Mr. Sushant Gosavi, Sales Manager Godrej Tyson Foods were present.

Mr. Gosavi said that "Chicken is the best source of protein. If we eat chicken on a daily basis then the protein demand of our body will automatically be fulfilled. Hence Eat Chicken and stay healthy.''

As a part of its 'Chicken Awareness Campaign,' the association has started a chicken promotional campaign through 'Television Commercials' on TV 9 Marathi from November 16, 2021. Earlier, the association started the 'Chicken Awareness Campaign, through radio jingles on Radio City. Through this campaign benefits of chicken and the nutritious value of chicken will be conveyed to people across Maharashtra.

In the next stage of the 'Chicken Awareness Campaign,' it is decided to organize 'Chicken Recipe Competition'. However, dates and other details will be dependent upon government guidelines related to Covid-19 restrictions.

Hence, the Poultry Farmers & Breeders Association (MH) requests the Press to give wide publicity to this initiative which not only helps to increase chicken consumption but also helps to boost the immunity of the people amid corona virus outbreaks.

Mr. C Vasanthkumar

President, PF&BA (MH)

Pigeon Farming: to Double the Income of Farmers

Suraj Amrutkar[1], Suhas Amrutkar[2], Bharti Deshmukh[3], Vinod Gupta[4] and S. K. Gupta[5]

1. Scientist, Poultry Science, SKUAST-J, Jammu.
2. SMS, Animal Nutrition, Parbhani Veterinary College, Parbhani, MAFSU
3. Assistant Professor, GADVASU, Punjab
4. Senior Scientist & Head, KVK Samba, SKUAST-J
5. Professor & Librarian, Medicine Division, SKUAST-J

Suraj Amrutkar

Introduction: Pigeon are domesticated from 4500 B.C. Domestic pigeons are decedents from the wild pigeon, distributed in Rocky Ravines throughout the Asia and Europe. They are generally kept for ornamental purpose. The production of young meat pigeon provides alternatives income to the small farmers. Squabs are being reared as a side line in village, towns and on farms. Squab rearing can be made profitable source of income with good management and market. Squabs require little land since all breeders are kept in small pens and houses. There are fair demand of squabs in large cities like Delhi, Mumbai, Kolkata, Hyderabad, Chennai and Bangalore. Squab rearing also has tremendous export potential to Dubai, Australia, Thailand and Singapore. A pigeon is a tradition part of Middle Eastern country diet. In China, pigeon meat is a popular restaurant dishes and there is a good demand from Jewish Community clubs all over the world. Rearing of pigeon using modern methods is a very profitable than traditional way.

Pigeons have been a friend of man from early times. They utilize not only for ornamentation but to get cheap food for the table. Pigeon are versatile birds and used for Sport of racing pigeon, Flyers and performers, showing of fancy pigeons and Meat production. In the earliest art, many used pigeons to symbolize love, peace and loyalty.

Advantage of Pigeon farming:

- Very interesting and profitable
- Very popular domestic bird
- Require less labour and low investment
- Cal also be raise and take care in free time
- Can be a great source of some extra income and entertainment
- It is very easy to handle them
- From their six month of age, they start laying eggs
- Two baby pigeon per month on an average
- Can be raised easily in the home yard and roof of the house
- It takes about 18 days to hatch their eggs
- Squab become suitable for consumption with their 3 to 4 weeks of age
- Diseases are comparatively less in pigeons
- Keep the environment safe by eating different types of insects
- The squab has a great demand as good patient diet.
- Different types of toys can be made by the feathers of pigeon

Squab business:

A squab is a young one of a pigeon, usually about 4 weeks of age, and the age just before it starts to fly. Squab meat is especially poultry products and a delicacy enjoyed by people throughout the world. Squab meat is moist, dark and tender with a mild flavor. Once people have taste the squab meat, they usually want to eat more and more.

Breeds:

There are about 300 different breeds around the world. There are two types of breed i.e. Meat Producing breeds and Entertaining breeds

Meat producing breeds: White King, Taxona, Silver King, Gola and Lokha

Entertaining breeds: Moyurponkhi, Shirazi, Lohore, Fantail, Jacobin, Frillback, Modena, Trumpeter and Loyal

Breeding:

It is difficult to tell the age and sex of pigeon by casual observation. Female pigeons are usually smaller than the males. Female sways rather than

walks and she holds her tail higher than the male. The pelvic bones are spaced further apart in female. The male is larger, more aggressive and makes a louder cooling noise. He tends to strut around the female during the mating season. Pigeons are ready to mate at about 4-5 months of age. Mating can be natural or forced mating. Forced mating can be accomplished by placing the desired male and female together in closed nest boxes or pens, with feed and water for 14-16 days or until they have settled down. A good breeding pair can produce 12 or more marketable squabs each year, with average weight of 400-750gm/squab. Females are kept for breeding up to 10 years and males up to 5 years. Main breeding season is during summer and spring. Artificial light can be used to shift the peak production from spring to autumn.

Egg laying:

Pigeon reproduction is governed by the ovulation rhythm. Pigeons usually lay one egg and then a second egg about 40 hours later. A breeding pair needs to have new nesting material each time when the female is ready to lay eggs.

Incubation:

Eggs hatch on the 17th day of incubation. There is often a break of one or two days between the laying of the first and second eggs, because of this, the first squab may not hatch until the 18th or 19th day. Both parents build the nests and take turns to sit on the eggs. The nesting period is 21-30 days. Pigeons incubate their own eggs; with the cock will sit on the eggs at mid-morning until noon, and the hen sits on the eggs for the rest of the day. Within 3-4 hours after eggs are hatched, the parents start feeding the squabs with their crop milk for the first 7-10 days. Crop milk is loaded with fat and protein and has little or no carbohydrates. Crop milk is secreted by fluid filled cells from the lining of the crop. It is creamy white mixture and is regurgitated into the young ones gullet. Immediately after hatching, the squab is weak and can not hold up its head. In about 2 hours, it can lift its head and usually start searching for food. During the first week, the main desire is for food. Juvenile pigeons are timid and inactive while they are being fed by their parents.

Both parents continue to feed the squabs, switching gradually to pellets or seed until the squabs are weaned out (28-35 days). At this point, they are ready to fly and pick their own food. Up to 3 weeks, the squab does not peck at anything with much attention. Be sure to provide fresh water and a balanced diet at all times. Squabs grow very rapidly until about 21 days of age. The growth is continuing at a slower rate afterword. Pinfeathers begin to form on the seventh day and the young bird can stand on its own feet by four weeks. At about 7-8 weeks, a vocal break occurs in which the pitch drops and the peeping call transforms into an adult “woo” call. After this voice break, aggressive behavior begins to show in the squabs. Both sexes undergo the vocal break. The female usually starts laying before the squabs are old enough to leave the nest, enabling the cock bird to continue feeding the squabs until they are ready for marketing. The hen will usually start laying again when the squabs are 2 week old. Although both parents will feed the squabs, most feeding will be left to the male after the next eggs are laid. As the hen starts laying before the squabs have left the nest, you must provide a double nest to prevent disturbance of the squabs and interruption of egg production. Since the parents will feed the squabs, you should not need to disturb the birds; in fact, the birds must not be disturbed during feeding.

Housing:

- Pigeon houses are called lofts.
- Built their house in a higher place. This will keep the pigeons, feed from dog, cat, mouse and some other harmful predators
- Ensure huge flow of air and light inside the house
- Prevent the entrance of rain water directly inside the house
- Built the house by thin wood or tin, bamboo or with packing boxes
- Every pigeon require about 30 cm long, 30 cm high and 30 cm wide space
- Every room of the pigeon house require the facilities of staying two pigeons
- Keep a door on every room measuring 10 x 10 cm

- Always try to keep the house clean and free from dirt
- Clean the house once or twice per month
- Keep the food and water pot near the house
- Keep some straw near the house, so that the pigeons can make bed for them
- Keep water and sand near the house, as they clean their body by water and dust

Double nest boxes:

A double nest box for a pair of pigeons should be about 40 cm high and 60 cm wide, and partitioned in the center to provide 30 cm for each nesting box. Nest should be 40 cm deep, and fitted with 20 cm wide external platform to allow pigeon easy access to the nest. Nest bowls can be placed in the nesting boxes to facilitate cleaning. A board can also be fitted in front of and running the full length of the box to prevent nesting material from spilling. Coarse materials such as pine needles, straw and wood shaving makes good nesting materials. The nesting material should place on a rock in a corner of the shed to prevent wastage. The pigeon will then take their requirements from this supply during the breeding season. Floor nesting should be discouraged, as squabs on the floor are prone to cannibalism.

Feeding:

Pigeon generally eat wheat, maize, paddy, rice, enamel legume, mustard, gram etc. Pigeon feed should contain 15-16 % protein. Every pigeon consume 35-50 gm of grainy feed daily. Along with this, feed them some green vegetables daily.

Pigeons are best on a diet of whole grain. It may be advantageous to crack large grains such as maize. The following is the list of the main nutritional requirements of pigeons.

Nutrients	%
Crude protein	13.5
Carbohydrates	65
Crude fiber	3.5
Fat	3

The type of grain used in a pigeon ration largely depends upon the cost and availability. However, it is a good idea to include some grains such as yellow maize and peas at all times. Pigeons normally molt and stop breeding in autumn and winter; requiring a lower protein diet than during the height of the breeding period. There is no real disadvantage in feeding a higher protein diet while during the autumn and winter months but it is less economical. Grains such as wheat, maize and sorghum are interchangeable, as are rape and millet, but allowances must be made for differences in proteins. Suitable rations for breeding pigeons in autumn/winter and spring/summer are given in table below.

Suggested pigeon ration		
Ingredient	**Autumn/winter (kg)**	**Spring/summer (kg)**
Wheat	15	8
Peas	20	30
Maize	10	7
Millet	5	5
Total	50	50

Pigeons may be fed either by hopper (so feeding is unrestricted) or by daily hand feeding. For hoppers or self feeders, allow 5 cm feeding space for each bird. Self feeders are labour saving and the pigeons have feed at all times, but they can be wasteful and attract rats and mice. Feed the birds twice daily when hand feeding, and give them only as much as they can eat in half an hour. Pigeons eat more feed in the colder months and when caring for squabs. In addition to grain ration, pigeons require minerals, vitamins and grit. As all grains have only a low mineral content, give pigeon access to a mineral mixture at all times. Vitamins A and Riboflavin supplements improve fertility and hatchability. Grit is needed for grinding up food in the gizzard.

Suggested mineral mixture (ad lib):

Cafeteria style feeding (placing various feed ingredients in separate containers) allows birds to choose grains of their choice. However, this system tends to be rather wasteful, as birds flick through the different seeds. Pigeons can be fed pellets, but some birds have trouble with pellets caking inside their crops. Twenty five (25) breeding pairs will eat

Mineral	Kilogram
Shell grit	17
Granite	20
Limestone	10
Salts	3
Total	50

about 3 kg of feed daily. One breeding pair will eat about 45 kg of feed and 4 kg of grit yearly. One pair of birds will eat 22 kg of feed to breeding age. A 500 gm squab is produced from 3 kg of feed, giving a feed conversion ratio of 1:6.

Baby feeding

Squab don't need extra feed for 5-7 days. They take *crop milk* from their parent stomach which is known as *Pigeon milk*. Male and female pigeon feed their baby in this way for 10 days. They become able to fly and feed themselves by their own.

Egg production:

- Male and female pigeon stay in pair
- They collect straw and makes a small nest
- Start laying eggs when they reach 5-6 months of age
- Lay a pair of egg after every one month
- Both male and female pigeon hatch the eggs one after another
- It takes about 17-18 days to hatch the eggs
- If artificial nest needed, make it
- As the eggs are very small in size, so squab production is very profitable than consuming the eggs

Diseases:

Diseases in pigeons are comparatively less than any other poultry birds. They suffer from T.B., Paratyphoid, Cholera, New Castle disease, influenza etc. The main diseases affecting pigeons are Chronic Respiratory Disease, Ornithosis, Canker, Pigeon Pox, Coccidiosis, Tuberculosis and Paratyphoid. A vaccine is available under permit to prevent pigeon pox. Besides this, they can also suffer from various louse and malnutrition diseases.

Pigeons have the same external parasite as poultry: lice, mites and ticks. If there are enough bathing facilities, external parasite will be kept to a minimum. As an additional precaution, nest boxes and nesting material should be treated with an approved spray or dust. Woodwork should be painted at least annually with wood preserving oil. All farms need a strict hygiene program to keep disease to avoid dampness, clean pens frequently, apply fresh litter or sand to the floor of the shed and isolate diseased birds from the rest of the flock.

Internal Parasites:

The large round worm (*Ascardia galli*) is the most common worm affecting pigeon. Treatment with either of the drugs *Piperazine* or *Levamisole* effectively control round worms. These drugs can be given to flocks in the feed or in the drinking water. Administration via the drinking water is recommended because the total recommended because the total required dosage can be given in only a few hours. The dose rate varies according t the drug used.

External parasites:

Lice are the most common of the external parasites that can live only on the birds, when separated from their host, they will die. There are a number of different types of lice, the most common being body lice. Apart from affecting the general thriftiness of birds, lice will also cause reduced weight gains and reduced egg production. An infestation of lice can best be controlled by dusting or spraying birds with an approved insecticide. The red mite (*Dermanyssus gallinae*) is the mite most likely to trouble pigeons. Mites are very small, only just visible to the naked eye. They live in crevices of woodwork in buildings and feed on the birds at night. To control mites, paint woodwork with a wood preserving oil, and spray the building with an insecticide registered for this purpose.

Control:

- Follow the advice of an experienced veterinarian
- Keep the pigeon house clean and germ free
- Separate the disease affected birds from healthy birds
- Vaccinate them timely
- Feed them balanced feed to prevent malnutrition diseases
- Use medicine for removing louse from their body

NATIONAL EGG CO-ORDINATION COMMITTEE

DAILY / MONTHLY EGG PRICES DECLARED BY NECC AND PREVAILING PRICES AT VARIOUS PRODUCTION CENTRES (PC) AND CONSUMPTION CENTERS (CC) NOVEMBER 2021

Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Average
NECC Prices																															
Ahmedabad	460	464	470	475	485	490	495	498	498	501	504	494	497	500	500	500	500	475	475	475	475	475	477	480	482	484	484	484	484	475	485.2
Ajmer	445	455	465	481	481	482	482	482	490	492	492	495	500	500	500	500	500	485	485	485	485	490	493	493	493	485	485	485	480	-	485.72
Barwala	434	440	453	466	476	476	476	480	486	490	490	495	500	500	500	500	500	500	485	485	485	490	490	490	490	490	490	490	482	-	483.76
Bengaluru (CC)	455	465	465	465	475	475	485	485	485	485	485	460	460	465	465	465	465	470	470	470	460	460	450	455	460	460	460	460	460	460	466.67
Brahmapur (OD)	415	415	415	425	439	449	455	455	455	455	459	461	463	470	470	473	476	476	476	464	454	454	457	462	464	464	464	464	464	464	455.9
Chennai (CC)	465	480	480	480	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	470	470	470	470	470	470	470	470	482.83
Chittoor	458	473	473	473	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	463	463	463	463	463	463	463	463	475.83
Delhi (CC)	457	457	465	480	502	505	505	505	510	514	514	514	525	525	525	525	525	525	525	510	510	510	515	515	515	515	515	515	515	505	508.1
E.Godavari	407	407	407	414	426	435	440	440	440	440	444	446	448	453	455	457	459	459	459	446	436	436	438	442	444	444	444	444	444	444	439.93
Hyderabad	405	410	415	425	430	435	438	438	441	444	434	437	440	443	443	443	443	443	430	420	420	422	426	429	432	432	432	432	425	425	431.07
Ludhiana	433	436	443	471	471	477	477	477	482	488	491	491	498	500	500	502	502	492	492	482	482	484	491	491	491	491	491	483	483	-	482.48
Mumbai (CC)	466	470	475	480	490	495	501	504	504	507	510	500	503	506	509	509	509	509	509	495	485	485	487	490	494	497	497	497	497	490	495.67
Muzaffurpur (CC)	486	486	495	510	510	529	529	529	529	529	538	538	538	538	543	543	543	543	538	538	533	533	538	538	538	538	533	533	533	529	529.27
Mysuru	460	468	468	468	480	480	490	490	490	490	490	460	460	465	465	465	465	465	465	465	455	455	450	452	457	457	457	457	457	457	466.77
Nagpur	425	465	470	475	475	495	495	495	495	495	495	480	480	485	485	485	470	470	470	460	460	460	468	468	468	468	463	463	463	-	474
Namakkal	455	455	455	465	465	470	470	470	470	470	455	455	455	455	460	460	460	465	465	465	465	450	450	450	450	450	450	450	450	450	458.5
Patna	476	481	486	500	500	524	524	524	524	524	529	533	533	533	533	533	529	519	519	519	514	514	519	524	524	524	524	524	524	519	518.43
Pune	465	470	475	480	490	495	501	503	503	505	505	500	500	502	505	505	505	505	505	495	485	480	482	485	487	490	490	490	490	490	492.77
Ranchi (CC)	481	486	490	490	500	524	524	524	524	524	529	533	538	538	538	538	538	538	533	533	524	524	533	533	533	533	533	533	533	529	524.37
Vijayawada	417	417	417	424	436	445	450	450	450	450	454	456	458	463	465	467	469	469	469	456	446	446	448	452	454	454	454	454	454	454	449.93
Vizag	402	402	402	415	426	460	460	460	460	460	460	460	460	460	460	460	460	460	460	446	436	436	438	438	440	440	440	440	440	440	444.03
W.Godavari	407	407	407	414	426	435	440	440	440	440	444	446	448	453	455	457	459	459	459	446	436	436	438	442	444	444	444	444	444	444	439.93
Warangal	407	412	417	427	432	437	440	440	443	446	436	439	442	445	445	445	445	445	432	422	422	424	428	431	434	434	434	434	427	427	433.07
Prevailing Prices																															
Allahabad (CC)	476	490	500	510	524	524	524	515	514	514	510	510	514	514	514	514	510	505	500	500	495	490	500	505	505	505	505	505	500	495	506.23
Bhopal	450	455	465	465	465	490	490	490	490	490	490	470	470	470	490	490	490	490	490	465	465	470	470	470	470	470	470	470	470	-	475.52
Hospet	415	425	425	425	435	435	445	445	445	445	445	420	420	425	425	425	425	430	430	430	420	420	410	415	420	420	420	420	420	420	426.67
Indore (CC)	450	455	465	465	475	485	485	485	480	480	480	480	485	485	485	485	485	460	460	460	460	445	445	445	450	450	455	460	460	-	467.59
Jabalpur	445	450	460	470	473	480	480	480	485	485	485	465	465	480	480	468	468	462	457	457	459	459	461	461	461	463	463	463	448	450	466.1
Kanpur (CC)	471	476	490	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514	500	500	500	500	500	500	500	500	500	495	505.67
Kolkata (WB)	475	475	475	485	500	510	510	510	502	502	505	512	520	520	525	530	530	530	530	505	505	505	507	507	507	507	514	514	514	514	508.17
Luknow (CC)	483	490	507	527	527	527	527	527	527	533	533	540	540	540	540	550	550	550	550	550	540	540	540	540	540	540	540	540	540	533	533.7
Raipur	435	442	447	447	462	462	472	475	475	475	475	465	465	475	475	475	475	475	475	460	460	460	460	462	464	463	465	465	450	-	464
Surat	480	484	490	495	505	510	515	518	518	521	524	510	510	510	510	510	510	480	480	480	480	480	482	485	487	489	489	489	489	480	497
Varanasi (CC)	487	493	500	517	524	527	530	533	533	533	533	533	533	533	533	533	527	520	520	520	520	520	520	527	527	527	530	530	530	517	523.67

Srinivasa Hy-Line

FLY MANAGEMENT: SURVEILLANCE AND CONTROL

INTRODUCTION

Fly infestations pose a significant challenge for poultry operations. Whether concentrated in a pit system, holding shed, or on a litter floor, poultry manure is an ideal medium for fly reproduction. Large fly populations can cause discomfort, stress, and decreased production in egg-laying chickens, pullets, and breeders. Flies also serve as a vector of both bird and human diseases. In extreme cases, failure to control flies may result in poor community relations or even litigation. Fly control and prevention is essential for success in the rearing and production of egg-laying chickens.

Figure 1. Musca domestica.

FLY BIOLOGY AND ECOLOGY

A basic understanding of the life cycle of flies and their interaction with their environment is important for developing strategies to reduce their impact. The following is focused on the house fly (*musca domestica*), a major pest on poultry farms.

Health Risks of Flies

Flies are known to be vectors for many diseases of both humans and livestock, and are considered a sign of unsanitary conditions. Flies may transmit disease by carrying viruses, bacteria, parasites, and fungi on their bodies, or through their mouth-parts after contacting or ingesting infectious materials. Chickens may eat flies at any life stage, and can become infected by ingesting the insects or by direct contact. Fly populations may also create a reservoir for disease on poultry farms, making disease treatment and elimination more difficult. Figure 2 outlines several major diseases of concern for poultry that flies may carry, though there are many more[2, 3, 5, 6, 8, 9].

Disease	Health Risk?	
	Chicken	Human
Avian Influenza	Yes	Yes
Botulism	Yes	Yes
Coccidiosis	Yes	No
E. Coli	Yes	Yes
Newcastle Disease	Yes	Yes
Roundworms	Yes	Yes
Salmonellosis	Yes	Yes
Tapeworms	Yes	Yes

Figure 2. Diseases of risk associated with flies.

Life Cycle

Flies pass through four distinct life cycle stages: egg, larva (maggot), pupa, and adult fly. The lifespan of flies from egg to adult is usually 2–3 weeks, but can vary depending on environmental factors including temperature, and be as long as 3 months under cool conditions. Figures 3 and 4 give an overview of these life stages[9].

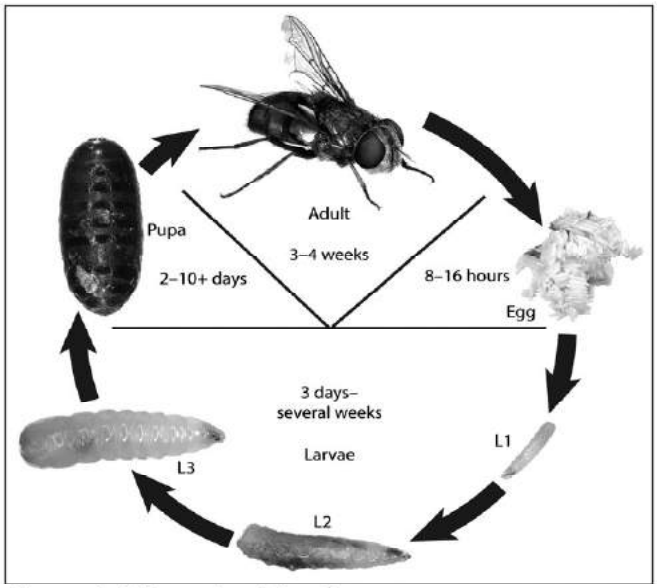


Figure 3. Life cycle of the fly.

Life Cycle Stage	Life Span	Key Features
Egg	8–16 hours[1]	• White, shiny, and difficult to see with the human eye • Laid in damp organic material (e.g. manure, garbage)
Larva	3 days–several weeks	• Account for 80–90% total fly population in most infestations. • Progress through 3 different phases ("Instars") as they eat and grow.
Pupa	2–10+ days	• Encased in reddish-brown exoskeleton. • Adult fly emerges within days depending on environmental conditions. • May remain dormant in soil/substrate under extreme weather conditions for extended periods of time.
Adult Fly	3–4 weeks	• Grey-black, winged insect, 6–9 mm long • Rest on horizontal surfaces when not eating or reproducing. • Females may lay 700+ eggs during life.

Figure 4. Life stages of the fly.

Breeding Sites

Flies reproduce and lay their eggs in rotting, decayed, or fermenting organic matter (e.g. garbage, manure, etc.) with moisture content between 50–85%. Fresh poultry manure has approximately 75–80% moisture content, making it highly desirable as a medium for development of fly populations[5].

Diet

Fly larvae have chewing mouth-parts, and consume any rotting organic material in their environment. Adult flies have sucking mouth-parts (proboscis), and must consume food that is already in a liquid state, or can be dissolved by their acidic saliva. Eggs and pupae stage flies do not eat, and survive entirely on stored energy[9].

Figure 5. Flies breeding.

Behavior and Distribution

As with diet, the behavior and distribution of flies varies by life-stage. Eggs are laid in organic material with 50–85% moisture content. Larvae remain in this environment, burrowing into the material. They must remain near the surface where conditions are moist, and they have access to oxygen. Their only activities are feeding and hiding. As the larvae mature they seek out drier material, and dig deeper beneath the surface (1–3 cm)[9].

After the adult fly emerges it is mainly active during daylight hours when it breeds and eats. Adult fly populations may have an activity range of 0.8–3.2 km (0.5–2.0 miles). They can travel much further by "hitching a ride" in a travelling car or truck. At night and any time when they are not eating or breeding, adults are considered at rest, or "roosting." Adults roost on any stable surface they can find (floors, walls, ceilings, furniture, plants, fences, garbage cans, etc.), preferring locations close to breeding or feeding sites. They may also adapt their activity somewhat to artificial lighting schedules[5, 9].

Adult flies are most active at temperatures between 20–25°C (68–77°F) with low humidity. At higher temperatures (greater than 95°F/35°C), they will spend more time resting, and may prefer to be outdoors. At temperatures below 10°C (50°F), adult flies and pupae may remain alive, but dormant[9].

MONITORING

Systematic monitoring of fly populations helps in decision making about when and where to deploy insecticides. It also can provide for a legal record in the event of a public health or nuisance complaints relating to flies originating from the farm. A consistent and reliable fly surveillance method provides a more accurate reference point for fly numbers than simple observation of adult flies.

Sticky fly tape is inexpensive and may help with identification of fly species. Hanging of tape in the aisles of chicken houses must be done strategically in areas where flies are more likely to circulate (such as near manure belts, or water lines), or fly numbers may appear lower than they really are. Additionally, tape may become clogged with dust making them ineffective within just a few days. An alternative use of is to take a moving tape count; walking a routine area of likely fly activity in each house (304 m/1,000 ft), while holding tape and counting the number of flies caught.

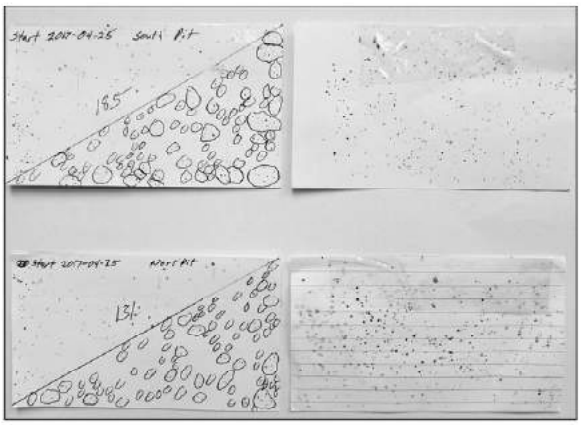


Figure 6. Examples of fly speck cards from a manure pit. Date, location, and number of spots are marked on card fronts.

Fly speck cards are another inexpensive means of fly monitoring (Figure 6). White index cards (8x12 cm/3x5 in) can be hung from the ceiling or rafters of the manure pit and other fly resting areas. Fly specks (brown spots left when flies land on the cards) are counted weekly. Fifty spots/card per week is a standard beyond which fly treatment with bait and residual adulticides is called for. 100 spots/card per week or more indicates use of a contact adulticide. Cards should be checked and changed at least once a week, but may need to be screened and changed more often if fly numbers are high. Cards should always be strategically positioned in the same location. Cards are easily dated and filed for record-keeping purposes.

Figure 7. An egg with many fly spots indicates a fly problem.

Fly traps can be hung from wire or placed on the floor of manure pit. Traps should be checked and bait replaced at least once a week. Traps are more costly to set up and change than speck cards, but they kill flies and allow for identification of fly species.

Screening for larvae in the manure pit is as important as monitoring for adult flies. The manure pit should be walked daily to screen for wet spots or areas where flies are visibly concentrated. Manure can be dug up to look for eggs and larva just below the surface. This provides an opportunity for precise application of larvicide and manure drying chemicals. Daily manure production covers treated areas, necessitating regular inspection of the pit[6, 9].

Figure 8. Flies are attracted to feed. This reduces feed efficiency for the flock and increases the risk of contamination.

FLY CONTROL STRATEGIES

Developing an effective fly control program is important for the success of any poultry operation. The most successful programs combine multiple control methods with diligent monitoring to minimize the economic and health threats posed by flies.

Sanitation

Manure management is the single most important aspect of fly control in poultry operations. Drying manure to less than 50% moisture content makes it a poor environment for fly reproduction. The manure pit must be walked daily to screen for fly blooms and wet spots. When wet spots are found the source of excess moisture needs to be identified and corrected. Common sources include leaking water lines, condensation from faulty insulation, improper ventilation (drying failure), and leaks from outside. Ventilation of the manure area with exhaust fans and air-circulating fans in the manure pit is important to aid in manure drying. Both indoor and outdoor manure and feed spills should be minimized and cleared as soon as they are noticed.

Dead birds, as well as cracked, dirty, and floor eggs should be disposed of quickly and securely as far from the chicken house as possible. Maintain clean office, entry, and break areas. Clearing grass, weeds, and clippings near the facility's perimeter or in nearby features like drainage ditches eliminates potential outdoor fly resting areas[5, 6, 9].

Structural Defenses

Maintenance of biosecurity barriers prevents outdoor flies and other pests from entering bird areas. Look for and seal cracks and breaches in the barn and connected structures such as feed bins and manure loadout sheds. Doors should be opened only when absolutely necessary.

Generally, enough force is produced by exhaust fans in the chicken house or manure pit to prevent flies entering against active airflow. However, when fans are not running they provide an ideal access portal for flies to enter the building. Fan louvers should always be closed to prevent flies entering the building when fans are off. If exhaust fan louvers, or any other area, must remain open for passive air-flow, the opening should be screened with a fine, securely installed mesh.

Physical fly traps placed near major access points can attract flies away from breeding areas. Baited traps can be made from jugs, cans or buckets and placed near portals or hung from the rafters of the pit. Sticky fly tape is less expensive and may serve the same purpose. Both of these traps also can be used for fly monitoring, but must be regularly checked and replaced to remain effective. Electrocuter light traps ("bug zappers") are effective, but costly, and are therefore of greater value in human working (offices, egg sorting rooms, etc.) and egg storage and transfer areas[6, 9].

Biological Defenses

Maintaining populations of other organisms that compete with or prey on flies can help to compliment other elements of a fly control program. Special attention must be paid in selecting which species to use for fly-control so as not to introduce a new pest. For example, hister beetles are well-known predators of fly eggs, and dump flies can successfully outcompete house flies, but both of these species can still carry and transfer poultry diseases. Certain mites thrive in poultry manure (*Macrocheles muscae domesticate* and *Fuscurooda vegetans*) and feed on fly eggs and larvae, but care must be taken not to confuse them with other mite species that are parasitic to chickens. Parasitic wasps can be purchased commercially, and introduced near fly breeding areas. When they emerge, they will seek out fly pupae and lay eggs inside them, killing the fly at this life stage. Large fly populations can quickly overwhelm biological control methods, so they should always be used in conjunction with other strategies[2, 3, 8]. In integrating parasitic wasps into a control strategy, it is important to be aware that many knockdown adulticides will also kill the wasps.

In addition to insects, microorganisms that harm flies may be introduced into the farm system. The bacterium *Bacillus thuringiensis* causes disease in flies, but not chicken or people. Where available, it may be spread on chicken manure directly, or fed through the chicken as a feed additive[7].

Chemical Control

There are four basic types of chemical insecticide fly control: larvicides, residual adulticides, baits, and contact adulticides.

Larvicides include contact larvicides and insect growth regulators (IGRs). They may be sprayed onto maggot infested areas directly, or, when manure is very wet, may be applied as a dry granule.

Residual adulticides are sprayed on surfaces where newly emerged flies are likely to rest. Residues may last from days to months depending on the product, and the surface it is applied to (porous surfaces like wood may absorb the chemical rapidly).

Examples of residual adulticides by class are outlined in Table B. **Follow local regulations regarding the use of fly control products in poultry facilities**.

Baits will attract flies and can be used in traps or as spot-on treatments indoors and outdoors. Some neonicotinoid, ryanoid, and carbamate class baits are outlined in Table C.

Contact adulticides can be fogged, misted, or sprayed as a last resort when other control measures fall short. These are generally pyrethrin or permethrin class products. Refer to Table D for example contact adulticides[2, 4, 5, 6, 8, 9].

TABLE A: LARVICIDES FOR FLY CONTROL

Class	Active Ingredient	Example Brands
Insect Growth Regulator (IGR)	Cyromazine	Flynexx, Larvadexx, Neporex

TABLE B: INSECTICIDES USED FOR RESIDUAL TREATMENT IN FLY CONTROL

Class	Example Brands
Organophosphates	Durashield, Rabon
Pyrehtroids	Lambda, Optashield, Stanguard, Tempo
Permethrin	Permacap
Imidacloprid	Credo, Exile

TABLE C: INSECTICIDES USED IN TOXIC BAITS FOR FLY CONTROL

Class	Compounds	Example Brands
Neonicotinoid	Imidiacloprid	Quickbayt
	Nithiazine	Quik Strike
	Thiamethoxam	Agita
Carbamate	Methomyl	Golden Malrin
Ryanoid	Cyantraniliprole	Zyrox

TABLE D: KNOCKDOWN INSECTICIDES FOR FLY CONTROL

Class	Example Brands
Permethrin	Permectin, Pyranna
Pyrethrin	BP-100, BP-36, Riptide, Microcare

Resistance and Rotation

Unfortunately, overuse of popular insecticide products over the years has led to the development of resistant fly populations. Rotation of the product used can help reduce the likelihood of resistance emerging. When rotating products changes should be made on the basis of chemical class (e.g. organophasphate or pyrethroid) rather than the brand.

Precise use of insecticides can help to reduce the development of resistance, as well as reduce the cost of treatment. Overuse of insecticides in manure areas may kill helpful biological defenders against flies. An effective monitoring program can guide decisions about precise and prudent insecticide applications[1, 2, 8].

Human Health Risks

Always read and follow the manufacturer's instructions for safe handling and personal protection whenever handling insecticides. Have appropriate gloves, goggles, clothing, footwear, respiratory protection, and any other personal protective equipment (PPE) indicated by the chemical's safety labeling. When in doubt, request an SDS (safety data sheet) from your vendor or supervisor.

In addition to direct human and animal health cautions, insecticides and cleaning chemicals may contaminate birds or eggs, rendering them unfit for consumption. For example, the chemical fipronil, present in some insecticides, can be passed into eggs if ingested by or applied on chickens. Be certain to use only products labeled for use around chickens in areas where bird contact is possible.

FLIES OF THE WORLD

House flies tend to predominate in poultry regions of the United States, but other species like the ones below may be more common in other areas of the world.

Figure 9. Blow fly.

Figure 10. Garbage fly.

Figure 11. Lesser house fly.

Figure 12. Soldier fly.

Figure 13. Stable fly.

REFERENCES

1. Bailey, D.L., D. W. Meifert, and P. M. Bishop. "Control of house flies in poultry houses with larvicides." Florida Entomologist (1968): 107–111.
2. Catangui, M. "Controlling disease-carrying house flies in poultry houses". Poultry Outlook Spring 2017. (2017): 11–14.
3. Catangui, M. "Getting to know the dump fly". Poultry Outlook Summer 2017. (2017): 10.
4. Catangui, M. "To larvicide or not: is that the question?" Poultry Outlook Summer 2017. (2017): 13–15.
5. Kauffman, P.E., D.A. Ruiz, and C.W. Pitts. *Pest Management Recommendations for Poultry*. The Pennsylvania State University. (2000)
6. Lyon, W.F. *Poultry Pest Management*. The Ohio State University Extension Bulletin 853. (1995)
7. Merdan, B.A. "*Bacillus thuringiensis* as a feed additive to control *Musca domestica* associated with poultry houses". *J. Basic & Appl Zoology* (2012) 65: 83–87.
8. Rowland, R. Chapter 11: Insect Problems in Poultry Production Facilities Chapter for Risk Management for Disease Prevention in the Poultry Industry. *A Practical Guide for Managing Risk in Poultry Production*. 2nd edition. Jacksonville: American Association of Avian Pathologists, Inc. (2017). 151–157.
9. World Health Organization. Chapter 6: Houseflies. *Vector Control – Methods for Use by Individuals and Communities*. 1997. 302–323. Online Edition.

IMAGE SOURCES

- **Figure 1:** Anagoria (username). "2013 Naturkundemuseum Berlin musca domestica anagoria." 9 March 2013. Online image. Wikimedia Commons. 27 October 2017. https://commons.wikimedia.org/wiki/File:2013_Naturkundemuseum_Berlin_musca_domestica_anagoria.JPG. Creative Commons license at https://creativecommons.org licenses/by/3.0/deed.en.
- **Figures 2–4:** Hy-Line International.
- **Figure 5:** André Karwath. "Anthomyiidae sp. 1 (aka.jpg." 8 September 2005. Online image. Wikimedia Commons. 28 March 2018. https://commons.wikimedia.org/wiki/File:Anthomyiidae_sp._1_(aka).jpg. Creative Commons license https://creativecommons.org/licenses/by-sa/2.5/deed.en.
- **Figures 6–8:** Hy-Line International.
- **Figures 9–13:** Centers for Disease Control and Prevention.
- **Back cover:** Jjharrison89@facebook.com (username). "Calliphora vomitoria Portrait.jpg." 27 August 2009. Online image. Wikipedia. https://en.wikipedia.org/wiki/Blue_bottle_fly#/media/File:Calliphora_vomitoria_Portrait.jpg. Creative Commons license at https://creativecommons.org/licenses/by-sa/3.0/deed.en.

SAMPLE FLY CONTROL PROGRAM

The following is a generalized program for a deep pit layer house, but should be adapted to the unique regional and structural component of a layer or layer breeder operation. Always follow all local regulations for chemical application and handling in bird areas[8].

1. A farm culture of biosecurity, sanitary maintenance of the premises, and regular inspection and maintenance of manure holding areas should be instituted and practiced by all farm personnel and support staff.
2. Fly speck cards are placed throughout the house, work areas, and egg holding area. Check at least once/week. If there are 50 fly specks/card or more proceed treat with a residual adulticide. If there are 100 fly specks/card or more, deploy a contact adulticide.

3. Spot treat all areas where maggots are present in litter piles (e.g. wet spots) with a selected larvicide every 1–3 weeks during peak fly season.
4. Apply fly bait *or* place baited traps every 3 m (9 ft) in the manure pit at the start of the peak season or during cleanout. Replace bait weekly as needed.
5. Apply a selected residual adulticide to vertical surfaces in the pit areas. Do NOT apply directly to litter piles. Repeat every 2–4 weeks during fly season. Repeat every 6–8 weeks during colder months.
6. Apply the same residual adulticide as in (5) to all outdoor surfaces where flies are observed resting. Repeat every 2–4 weeks.
7. In cases of large adult fly blooms, or if fly numbers are at 100 fly specks/card/week or more, A fogged pyrethroid contact adulticide should be used.
8. Rotate class of adulticide used between each flock, OR if fly numbers have not declined after application of a contact adulticide as in (7).

CONCLUSION

Fly control is a daily activity in egg layer facilities. Depending on season, fly numbers can reach critical levels in a matter of days if adequate measures are not taken for prevention. Flies are a major irritant to chickens, as well as those working with them. They also harbor and carry diseases that impact both birds and people. Reducing fly numbers enhances bird performance and improves food safety.

SAI KRISHNA

POULTRY EQUIPMENTS

Chick Feeder

Egg Tray

Chick Feed Tray

Chick Drinker

Drinker
(Assemble Valve System)

Deluxe Drinker
(Standard & Large)

Feeder

Gas Brooder

Chain Link Mesh

Jumbo Drinker

SAI KRISHNA PLASTIC INDUSTRIES

Manufacturers of Plastic Poultry Equipments

Factory : Behind Petrol Bunk, Padmanagar, Karimnagar - 505002, Tel : 0878 - 6504508, Mobile : 98490 59508
Sales Depot : Plot No : 11,Road No:2, Opp : Nimanthran Function Hall, Mamatanagar Colony, Nagole, HYDERABAD - 68. (A.P),
Tel : 040 64610508, Mobile : 92466 59508, E-mail : info@saikrishnapoultry.com, Web : www.saikrishnapoultry.com


Precession in Technology, Efficiency in Results
Concentrated Mix of
essential oils
FROM ITALY
MixOil®
...part of your success
Effective Substitute of grow promoting antibiotics and Strengthens immune system for Poultry (Proven in India since 2014)
Available in India
MixOil Powder : Micro encapsulated special technology slow and gradual release components.
MixOil Liquid : For fast results in acute conditions in water.
For Details Contact: South Asia Region
Ramddas N,
Cell : 9848413213
nramdas@hotmail.com
A.W.P.®
info@awpint.com
www.awpint.com
A.W.P. srl - via IV Novembre, 23
41051 Castelnuovo Rangone (MO) Italy

Nobilis® IB Multi Range

For solid & durable Infectious Bronchitis protection.

A whole world of protection

The most comprehensive vaccine range for Infectious Bronchitis control

Live IB Vaccines

Massachusetts Serotype Strains

Nobilis® IB Ma5
Live freeze-dried vaccine containing Infectious Bronchitis virus, strain Ma5, serotype Massachusetts.

Nobilis® Ma5 + Clone 30
Live freeze-dried vaccine containing Infectious Bronchitis virus, strain Ma5, serotype Massachusetts and Newcastle Disease virus, strain Clone 30.

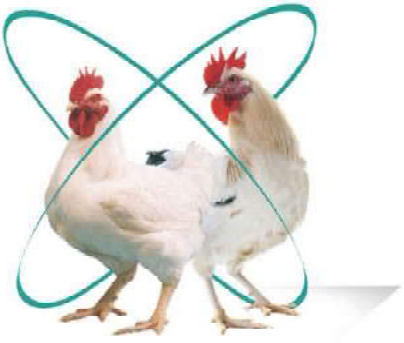
Inactivated IB Vaccines

Nobilis® IB+ND (Massachusetts / killed Clone 30)

Combined inactivated oil emulsion vaccine containing Infectious Bronchitis virus, strains M41, serotype Massachusetts and Newcastle Disease virus, strain Clone 30.

Nobilis® IB multi + ND
Combined inactivated oil emulsion vaccine containing Infectious Bronchitis virus, strains M41, serotype Massachusetts & D207/D274 and Newcastle Disease virus, strain Clone 30.

Your **guarantee** for **continuous production**



Nobilis® Corvac-4

Broadest protection ever... Tetravalent vaccine

Protectotype

ONLY FROM MSD ANIMAL HEALTH

MSD Animal Health

112-08-2021

Date of Publishing: 1
Date of Posting: 4th & 5th of every month

POULTRY LINE RNI APBIL/2001/3823
Postal Registration No. HSE/751/ 2021-2023

Venworld®
THE BEST IN ANIMAL HEALTHCARE

VH-V4K

A comprehensive vaccine designed for providing **active immunity**
To the breeders and **passive immunity** for progeny

Ground-Breaking ND+IB+IBD+REO Inactivated Vaccine

VENTRI BIOLOGICALS
(Vaccine Division of VHPL)
Venkateshwara House, S. No. 114/A/2, Pune-Sinhgad Road, Pune - 411 030. **Tel.** : +91-20-24251803 **Fax :** (020) 24251077, 24251060

Email: ventri.biologicals@venkys.com **www.venkys.com**