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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
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INDEX OF ADVERTISEMENTS

MYSTERIOUS INDIA

The world media and people are generally foxed at any notable development that happens of late in India. They are hard wired mentally to project India in a skewed manner; the world has a fixed desired image that they would always like to see it. The manipulation has gone too far and is miserably failing when the social media and open and free communication platforms, consistently makes many a truth surface in open.

The idea of the image of the country as only a poor, dirty and snake charmers country has replaced with many an astonishing development consistently. India - is the future super power and one among the top 05 economies in the world by GDP. The way India managed to fight Covid and produce and supply free vaccines globally. The growth in the Military might; the Moon, Mars & Sun missions stuns the global scientists in dis-belief. The India's views, approach and role in the global wars; the assertion of its values when choosing partners among two warring sides; building friendship across the divided world; Leadership positions in global corporate world; Producing a wealth of talented educated pool that is demanded across the world.

India being a Hindu majority country for thousands of years never showed might in displaying its strength wrongly. The Sri Ram's birth place a few thousands of years old was demolished and occupied by the Muslims for a few hundreds of years. The Hindus fought a legal battle under a democratic principle and later re-established the temple. There is no second example of such a civilized method in the world?

Once in majority there is no rule of law followed by any country in this region- it's just moved down until the minority is decimated or no more. Iran, Pakistan, Afghanistan and many others have used might is right when it comes to minorities.

The freedom in India under democracy is exploited to an extent that the minorities have chosen to exploit and even abuse at the cost of majority in quite a few ways.

Shocking to see the duplicity of the world media when they chose to project the Ram temple Pratishthan in a completely negative lime light.

It shows that the other communities are feeling threatened and insecure with the rise of the Hinduism which is a wise, non-coercive, brotherly, non- violent and the one that preached in-conditional live not only among Human but also animals and the Plants. How can such a noble & eternal philosophy ever be a threat? Hinduism is the oldest surviving religion in the world and any amount of onslaught will not be able to destroy it. In India the people are Hindus or were Hindus!

Under the current global turmoil and destructive tendencies many will find solace and peace only with a rational, peace loving, rational, time tested, philosophies. Hinduism advocates and believes in 'Vasudaivika kutumbakam'- the whole world to be a One Family- a rare concept never even thought by others. The history records and evidences show that more than 100,000 temples were destroyed and converted into other form of worships. So how does it become an issue when a rightful and in a democratic way the justice is demanded. Such fake politically driven agenda will not sustain the test of time.

Besides Indian politics the true worth of Indians has come to be appreciated in the world - the Sanatan dharma, Yoga, Ayurveda, Sanskrit & Hindu philosophy is being attracted out of knowledge and wisdom and not out of forced belief and conversions.

NUTECH BIO SCIENCES INDIA PVT. LTD. ORGANISED TECHNICAL SEMINAR AT HYDERABAD.

Nutech Bio Sciences India Pvt Ltd has organized a Technical Seminar at Hotel Avasa, Madhapur on 6th January 2024.

Inaugurating the seminar Dr. P.V. Reddy, founder and CEO has explained the house about the recent developments at Nutech Bio Sciences India Pvt Ltd., through a video presentation. He informed that they have recently created facility to manufacture Poultry, Acqua and Animal Health products at Pulivendula of Kadapa District in Andhra Pradesh with ultra modern equipment and huge infrastructure in an extent of 10 Acres. They have incorporated their company in New York in the year 2010 for manufacturing of all required products for Poultry, Diary, Aqua, Horses and Pet products adhering to FDA standards. First they have started distribution in Hyderabad and achieved Pan India market from 2015 onwards. They propose to propagate antibiotic free farming in Indian markets as they practice in US. They have established R&D wing also for this purpose with the necessary Laboratories.

Dr. Rais Rajpura, Asssistant Professor & Head of the Department of Animal Sciences, Anand Agricultural University, Anand, Gujarat has presented a topic on “Broiler Breeder Nutrition, Gut Health, Chick Quality and Immunity”.

Dr. A. Natarajan, Professor & Head of the Department of Animal Sciences, Feed Analytical and Quality Assurance Laboratory of Veterinary College & Research Institute, Namakkal made a presentation on “Strategic and Intelligent Replacement of Soya Meal and Maize in Broiler and Layer rations”.

A life time achievement award was conferred on Dr. V. Rama Subba Reddy, a Retired Professor and Head, Department of Poultry Science, APAU, Rajendranagar, Hyderabad, by Nutech Bio Sciences India Pvt Ltd. The

82 year old Retired Professor has taught lessons in Animal Nutrition to a number of Students and guided many Veterinary stalwarts to acquire PhD degree. His articles were published in all popular Journals for the last four decades. Dr. P.V. Reddy, CEO of Nutech has presented a Shawl, bouquet and memento and honoured Dr V Rama Subba Reddy.

Mr. Venu Babu, Regional Executive has welcomed the guests to the meeting and Mr. Bala Subramaniam proposed vote of thanks. The meeting was ended with a cock-tail and sumptuous dinner.

AVIAN ILLNESSES AND WINTERTIME PRECAUTIONS

Dr. Anil Kumar M.V. Sc Scholar, Department of Livestock Production Management
Rajasthan University of Veterinary and Animal Sciences, Bikaner (Rajasthan)
*Corresponding author: anilbakolia33@gmail.com

Introduction

The harsh winter months are stressful for both humans and animals. As predicted, the human flu is spreading throughout most houses this season, and in similar winter conditions, epidemic poultry diseases are also being recorded. The climate is moist and cold, which facilitates the spread of germs that cause sickness. Wet season temperatures are characterized by a decrease in temperature and an increase in relative humidity. These factors significantly modify the bird's bodily system, in addition to possibly frigid winds. Stress from these changes in the environment impairs immunity and raises the likelihood of illness. Many common and dangerous diseases can harm a bird's respiratory system, including its lungs, air sacs, and airways.

Some of the poultry diseases common during the winter season

Avian influenza

Known by most as "bird flu," it has gained international notice over the years because of the harm it causes to the chicken business, farmer livelihoods, international trade, and the wellbeing of wild birds. To stop the spread of avian influenza, it is occasionally practiced to remove all hens, sick or well, in areas where outbreaks are occurring. As a result, farmers will experience large financial losses that will negatively impact their way of life going forward. Every time avian influenza viruses are prevalent in poultry. Depression, appetite loss, cessation of egg production, neurotic symptoms, swelling and blue staining of the combs and wattles due to blood circulation problems, coughing, sneezing, and diarrhea are the primary signs of high pathogenic avian influenza in chickens. Death can come unexpectedly and without notice. The fatality rate can be as high as 100%, depending on the species, age, type of virus implicated, and environmental conditions including coexisting bacterial infections. The primary clinical signs of low pathogenic avian influenza include mild respiratory illness, depression, and decreased egg production in laying birds. These viruses can spread throughout a flock of birds in as little as 14 days and have brief incubation periods, ranging from a few hours to three days.

Fowl pox

The two main ways that fowl pox spreads are through direct contact between susceptible birds or mosquitoes carrying the infection. Additionally, infected birds may shed scabs that harbour viruses and spread the infection. The respiratory tract, skin wounds, and eyes are all places where the virus might enter the bloodstream. Mosquitoes contract the disease when they feed on birds whose blood contains fowl pox. Mosquitoes are the primary carrier and reservoir of chicken pox on poultry ranges. There are several mosquito species that can transmit chicken pox. Since mosquitoes commonly overwinter in poultry buildings, epidemics may occur in the winter and early spring. Laying hens can stop producing eggs due to an illness. Wet form cankerlike lesions are located in the mouth, pharynx, larynx, and trachea. The moist form could clog upper airways and cause respiratory distress. Depending on the region, vaccinations against fowl pox should be given to birds between three and six weeks of age.

Worms' infestation

This is typical during the winter months, particularly for birds that are allowed to roam freely. Drinking water contaminated with intestinal worm eggs is the cause of this. Birds should be dewormed during this period with broad-spectrum anthelmintics/dewormers, such as piperazines and levamisole. Observe the withdrawal period at all times.

Bacillary White Diarrhea (Pullorum Disease)

Salmonella Pullorum bacteria is the cause of Bacillary White Diarrhea. The diseases can spread mechanically, by touch, consumption of contaminated food, water, or bedding, faeces from diseased birds, and eggs; vertical transmission can also happen in freshly hatched chicks as a result of transovarial transmission. Because of this, chicks are more vulnerable to this illness than adult birds and may exhibit significant mortality up to three weeks of age. In a clinical setting, juvenile birds exhibit blindness, lameness, huddling, glued vent, somnolence (sleepiness), and labored breathing, among other symptoms. In stressed or immune-compromised flocks, morbidity can vary from 10 to 80%, and mortality typically increases at 7 to 10 days and can reach 100%. Since adults are often asymptomatic, a decrease in hatchability, fertility, or egg production may occur. Treating the flock as a whole

and the afflicted bed with a broad-spectrum antibiotic is one way to treat Pullorum, E. Coli, and salmonellosis infections. Maintaining high standards of farm/pen hygiene and sanitation is crucial. There should be biosecurity protocols in place. Don't give tainted feed to birds.

Fowl Cholera

Pasteurella multocida is the bacterium that causes fowl cholera, a bacterial disease that affects birds 6 weeks of age and older. It is a dangerous and extremely contagious illness with a 100% morbidity and death rate. Symptoms can range from acute septicemia to localized, persistent infections. The disease is spread by faeces, contaminated soil, persons, equipment, and nasal exudates. Seeing a high death rate in the acute form without any previous clinical symptoms is typically the first clue that anything is wrong. Depression, anorexia, oral mucus production, ruffled feathers, diarrhea, and elevated respiratory rate are typically observed in longer-term instances. Signs and lesions of the chronic type of fowl cholera are typically associated with localized infections of the swollen sternal bursae, wattles, joints, tendon sheaths, and footpads, among other areas. Pharyngitis and conjunctivitis may be exudative. When the meninges of the brain and spinal cord, middle ear, or cranial bones are compromised, torticollis may arise. Acute cases result in the unexpected death of seemingly healthy birds, whereas chronic cases cause yellow, green, or grey diarrhea in the affected birds. decrease in appetite, gasping for breath, Ruffled feathers, drooping wings and tail feathers swelling in the foot pad, wattle, sinuses, and leg joints, torticolis or neck twisting, leak from the beak or nostril. Tetracycline and erythromycin are two sulfa medications that can be used to treat fowl cholera. A fowl cholera vaccine can be given to poultry birds to protect them from the disease.

Aspergillosis/ Brooder's Pneumonia

Aspergillus fumigatus is the fungus that causes aspergillosis in poultry chickens. Feed or litter dampening is prevalent during the rainy and cold seasons due to high humidity and little sunlight, which fosters the growth of fungi in poultry environments. Aspergillus spores are breathed by birds, and when these spores grow into lesions that fill the lungs, respiratory issues result. Typical symptoms include gasping and open mouth breathing. If the ventilation facilities are insufficient and the stocking density is excessive, birds kept under intensive management methods are likely to suffer from high disease spread. Aerosolized spores, which are frequent in hatcheries, contaminated dust, and litter in the home are factors that contribute to the spread of disease. There are two forms-

A) Acute form: Also known as brooder pneumonia, this usually affects young chicks raised by brooders. Rapid onset results in significant morbidity and mortality. Within a few days after infection begins, afflicted birds die. Lethargy, despair, appetite loss, labored breathing, cyanosis (bluish/purplish comb), and death are among the most typical symptoms.

B) Chronic form: It could take a few weeks or months for this to manifest. Malnutrition, stress, coexisting illnesses, or extended use of antibiotics or corticosteroids are common causes in older birds. Weight loss, decreased appetite, intolerance to exercise, elevated respiratory rate, vocalization (voice) alterations, tail bobbing, audible respiratory sounds (rales), and open-mouthed breathing (gasping) are among the most prevalent clinical symptoms.

Coccidiosis

In poultry, coccidiosis is a protozoal disease that manifests as enteritis and bloody diarrhea and is caused by different intracellular species of the genus Eimeria. The intestinal mucosa sustains significant damage due to the fast (4-7 days) infectious process that causes parasite proliferation in host cells. The various species of poultry coccidia parasitize different sections of the intestine, and they are often host-specific. The hot pen temperature and damp litter that are frequently seen during the rainy season encourage the coccidial oocyst to sporulate, which in turn promotes the coccidiosis outbreak. Anaemia, ruffled feathers and clinically bloody faeces are noted. Other symptoms include severe diarrhea, high mortality, and a reduction in growth rate to a large proportion of sickly birds. Outbreaks may accompanied with decreased egg production, weight loss, cull development, reduced feed and water consumption, and higher mortality. Subclinical or mild infections can depigment feathers and could result in subsequent infections, especially with Clostridium species. Severe infection survivors heal in 10-14 days, but they might never regain their previous level of function. The majority of the lesions occur in the intestinal system, and many of them are easily identifiable by their specific location and appearance, such as the brown to blackish red haemorrhages in caecae.

Bumble foot (Ulcerative pododer matitis)

The word "bumblefoot" refers to the enlargement of a chicken's footpad, or the spongy part of the foot.

This is an inflammatory disease that is very frequent in older backyard hens and birds raised on damp litter or unclean flooring. Due to the abundance of bacteria, including Staphylococcus, on these types of floors, the skin of the chicken's foot becomes infected, resulting in an abscess filled with pus. A cut, scrape, abrasion, or even just a rough place on the skin from walking on damp, filthy bedding can serve as a bacterial entry point and exacerbate various foot infections. The most typical behavioural signs include limping and complete lack of use of the affected limb because of excruciating discomfort. The infection has probably been festering for a while by the time limping is observed. Upon examination, the footpad may show signs of redness, swelling, an abscess, and a lesion that resembles a callous, a lump between the toes, or a black scab.

Infectious Bursal Disease (Gumboro, IBD, infectious bursitis, infectious avian nephrosis)

A highly contagious and deadly virus disease that primarily affects young birds, often those between the ages of three and six weeks. The virus is an RNA member of the Birnaviridae family. Due to the disease's attack on the bursal component of the immune system, immature B cells are destroyed, which results in immunosuppression and increased vulnerability to secondary infections. Bird-to-bird contact, in addition to contact with contaminated people and equipment, is how disease is spread. Bird droppings contain viruses that can be carried by the wind and land on dust particles. The illness could manifest itself as an abrupt decrease in feed and water intake. Severe prostration, lack of coordination, diarrhea with water that stains feathers near vents, vent picking, cloacal inflammation, and other symptoms are possible in chickens. Typically, flock morbidity is 100%, and death might vary from 5% to 20%. Infected chickens under three weeks of age do not exhibit the clinical signs of the disease, but instead exhibit severe and lifelong immunosuppression as a result of bursal plecae loss and subsequent atrophy. Symptoms include: extreme prostration; watery diarrhea; incoordination; cloacal inflammation; soiled vent feathers; and vent picking. There is no known cure or treatment for this illness, it can be stopped in its tracks by immunizing birds before an outbreak happens. If a flock has already been affected by the disease, the flock should be killed and the enclosures should be cleaned. Chickens should receive the Gumboro Infectious Bursal Disease Vaccine (IBDV) between the second and fourth week of their lives.

Common preventive measures to be taken to minimize disease outbreaks

1. A strategy known as "all-in, all-out" should be used to stop the spread of infection horizontally. To preserve the current stock, quarantine the fresh batch for at least two weeks if this approach is impractical.
2. Add more oil or fat to the birds' diet or reduce the amount of nutrients they don't require to generate heat. This is necessary to avoid wastage and reduce feed production costs because birds need to eat more feed in order to produce heat.
3. To give the birds a backup source of heat, the pen should have heaters or electric lamps. By doing this, the birds would be able to stay warm and drink adequate water without depleting their stored energy.
4. Make sure there is enough airflow in the shed to remove moisture and ammonia, keeping the litter dry and sanitary.
5. Building a large roof overhang over the chicken house's entrance and sides to keep rainwater out. To stop rainwater from entering the chicken house during heavy downpours, a large overhanging roof was constructed over the entrance and sides.
6. Build a foot dip at each of the chicken house's entrances, and always pour a potent disinfection solution to the foot dip.
7. Adhere closely to the recommended immunization schedule to prevent the diseases for which vaccinations are available.
8. Maintain a high standard of biosecurity and keep out rats, scavenging birds, other animals, and unapproved workers from entering the agricultural area as they could be the sources of infection.

Conclusion

Respiratory infections are more common in backyard and commercial poultry raising alike. It implies that there is greater competition in the control of health in poultry production. Adhere to national guidelines for immunization and biosecurity measures, implementing strict protocols for biosecurity and administering the necessary immunizations to prevent respiratory infections.


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Acidomix DF+: An Unique Solution for Improved Productivity and Salmonella Control in Broilers and Layers.

Christian Lückstädt, Addcon Asia Ltd, India.

Organic acids have long been used in animal nutrition, usually to stabilize compound feed, but also to enhance animal performance. In poultry one of the first reports of improved broiler performance when diets were supplemented with single acids was for formic acid (VOGT et al., 1981). Later, similar effects were noticed for fumaric acid (PATTEN et al, 1988; KIRCHGESSNER et al., 1991; SKINNER et al., 1991). IZAT et al. (1990a) found significantly reduced levels of Salmonella spp. in carcass and caecal samples after including calcium formate in broiler diets. In another trial from IZAT et al. (1990b), buffered propionic acid was used to counteract pathogenic microflora in the intestine and carcass of broiler chickens, and resulted in a significant reduction in E. coli and Salmonella spp. The use of pure formic acid in breeder feed reduced the contamination of tray liners and hatchery waste with S. enteritidis drastically (HUMPHREY et al., 1988). KIRCHGESSNER et al. (1992) found significantly better feed utilization in laying hens after adding fumaric acid, but only when the feed was low in protein and methionine and cysteine. Performance enhancement was influenced by both quantity and quality of the protein. Although growth performance benefits of organic acids and their salts have been shown in numerous studies over the past half-century, the significant increase in scientific and commercial focus shifted on it only after ban on antimicrobial growth promoters in Europe.

An important limitation, however, is that organic acids are rapidly metabolised in the foregut (crop to gizzard) of birds, which will reduce their impact on growth performance. A new molecule (sodium diformate, similar to potassium diformate) has been proven to be effective against pathogenic bacteria, including salmonella, along the whole gastro-intestinal tract (LÜCKSTÄDT et al., 2009). The reduced impact of pathogenic bacteria on the broiler, as well as the improved gut microflora, leading to a state of eubiosis in treated chickens, suggests that including sodium diformate in broiler diets will also result in improved bird performance. Several trials have also been carried out over the last half-decade world-wide that document positive effects on broiler performance.

It was therefore interesting to estimate the potential impact of sodium diformate (Acidomix DF+) in poultry production and Salmonella control through an analysis of the results of such trials.

Effect of Acidomix DF+ on Broiler Performance

This study analyzed the average impact from all studies on the effect of the additive on the performance parameters weight gain, feed efficiency, mortality, and productivity, as measured using the European Broiler Index, (EBI). EBI is calculated using the following equation:

EBI = ADG [g] × survival [%] / (10 × FCR)

The final dataset contained the results of 8 documented, negatively controlled studies, comprising 17 trials with DF+-inclusion, which ranged from 0.1% to 0.6%. Those studies were carried out between 2006 and 2012 across the world under both commercial and institutional conditions and included more than 36,700 broilers from different breeds (Arbor Acres, Cobb, Hubbard) raised to between 35 and 44 days. The above-mentioned performance parameters are expressed as percentage difference from the negative control. The results are given as mean and were statistically analysed using the t-test. A confidence level of 95% was defined for these analyses.

The average level of dietary DF+ from the dataset in all treated broilers was 0.28%. Typical dosage for DF+ in broilers ranges from 1-2 kg/tone feed, depending on age (dietary protein level) and hygienic status of the farm. As shown in Table 1, DF+ inclusion resulted in a numerical increase in

feed intake of 1.1% (P=0.22).

Table 1. Performance analysis of 17 trials with broilers, fed diets with Acidomix DF+, expressed as an average percentage difference from negative control.

Dosage	Feed int ake	Weight gain	FCR	Survival	EBI
0.28	+1.1	+5.2	-4.1	+2.3	+12.4
P-value	0.22	0.0001	0.002	0.034	0.0005

The performance of broilers based on daily gain was significantly increased by 5.2% (P<0.001). Furthermore, the FCR was also significantly improved (4.1%; P<0.01). Survival was increased on average by 2.3% (P<0.05). Finally, the EBI improved significantly due to the inclusion of NDF by 12.4% (P<0.001). In broilers, improved zootechnical performance is thought to stem from both improvements in the intestinal microflora, as a result of suppressing pathogenic bacterial species, and improved protein digestion. As often seen with other additives, hygiene challenge also plays some role in the performance observed. In the present performance analysis, a range of hygiene conditions were included, representing both university and farm trials. The average impact of DF+ inclusion on performance remained above that normally expected. It can therefore be concluded that dietary sodium diformate (Acidomix DF+) can play an important role in improving broiler production world-wide, especially in times of high raw material prices.

Effect of Acidomix DF+ on Salmonella Control

Salmonella ranks among the world's biggest threats to health. Annually, it has been estimated that cases of human salmonellosis in the United States may actually vary from 2 to 4 million (Jones, 2011). Developing and implementing effective Salmonella monitoring, reporting and control systems is prioritised in many countries. Salmonella is often associated with poultry products, mainly chicken and eggs. Salmonella is widely distributed in nature (Winfield and Groisman, 2003) and can survive for an extended period of time on diverse materials (Humphrey, 2004). Since its discovery in the late 19th Century, more than 2,500 different serovars have been discovered. These have emerged over the past 30 years, in parallel with the development of intensive systems of animal husbandry. In the European Union, the proportion of Salmonella and E. coli isolates resistant to ampicillin, sulfonamides and tetracycline were found to vary between 5 and 68 % in poultry, pigs and cattle. Some Member States reported a high occurrence of fluoroquinolone resistance in Salmonella isolates from poultry (5-38%), (EFSA, 2010).

The risks posed by contamination with pathogenic bacteria in the food chain can be reduced without the prophylactic use of antibiotics. Applying appropriate control measures at intervention points in the food chain can help reduce the risk of Salmonella proliferation. While Salmonella cannot be fully eradicated in poultry units, it can be controlled to minimise the risk to consumers. According to Jones (2011) Salmonella control measures in feed can be divided into three major categories: prevent contamination of the facility; measures to reduce multiplication of the bacteria in the plant; and procedures to kill the pathogen. Biosecurity plays a significant role in Salmonella control. In feed compounding, although heat treatment is effective in reducing contamination of feed leaving the feed mill, this effect does not persist during transport, storage and subsequent out-feeding. When conditions within the feed are less conducive to bacterial infection, Salmonella contamination can be reduced. The next critical control point is within the bird, where conditions for bacterial growth are optimal. Salmonella growth is optimal between 35 and 37°C, with moisture content greater than 12% and a pH of 4.5-9.0. Jones (2011) suggests addition of chemical agents to the feed to control Salmonella. This may primarily involve the use of organic acids.

Since the 1980's, reports have shown organic acids, and formic acid in particular, to be especially effective against Salmonella, when used in poultry diets. The use of pure formic acid in breeder diets reduced the contamination of tray liners and hatchery waste with S. enteritidis drastically (Humphrey and Lanning, 1988). By 1990,

researchers in the US found significantly reduced levels of Salmonella spp. in carcass and caecal samples, after including calcium formate in broiler diets (Izat et al., 1990). Further research (Kovarik and Lojda, 2000) reported that inclusion of formic acid at 0.5% in the diet can be successfully used on farms to reduce salmonella contamination in the feed, excretion of Salmonella spp. and re-infection of chicken populations.

A number of practical considerations also need to be addressed. Pure formic acid, although it is very effective in controlling Salmonella in feed, is corrosive, hazardous, and volatile, so is difficult to handle easily and safely in the feed mill. Furthermore, pelleting may incur losses of around 15% of the acid. Often, liquid and volatile acids exert their antibacterial effects only in the feed and the birds' foregut. More recently, research has focused on overcoming these limitations to develop chemical compounds which are heat-stable, non-corrosive and yet still effective. Sodium diformate (Acidomix DF+, hereafter abbreviated as DF+) satisfies such industry requirements. An organic acid salt, it is crystalline and non-volatile, meaning that it can be used safely in the feed mill, as well as being effective in the animal.

A UK-study evaluated the anti-Salmonella effects of DF+ in vitro, against Salmonella enteritidis (SE) S9549/07 found in broiler flocks (Wales et al., 2013). Caecal and crop samples were taken from slaughtered broilers from small-scale commercial operations. Caecal contents were used fresh; crop contents were stored at -80°C and thawed before use. Both were mixed with quarter strength Ringer's solution (crop at a 1:1 ratio; caecal contents at 1:2). DF+ was added to 20g aliquots in tubes. These were incubated in a water bath for 10 minutes at 41.5°C, after which time a 0.1ml stationary phase SE culture was added. All preparations were vortex mixed and incubated at 41.5°C. After various time intervals (1, 4 or 8 hours for crop contents; 1, 4, 9 and 24 hours for caecal contents), 5g aliquots were taken, mixed with buffered peptone water (BPW) and prepared for Salmonella enumeration. SE counts were recorded as a log reduction, compared to the negative control.

The objective of the second study was to evaluate the effect of DF+ in broilers in vivo, on the control of bacterial contamination in the digestive tract in comparison to a negative control in-vivo (Lückstädt and Theobald, 2009). 1125 broilers were distributed in 9 batches of 125 birds each (5 batches in the treatment; control with 4 batches only). The broilers were fed the following program: starter diet for 21 days, grower diet for 18 days and finisher diet for 3 days only. Birds were treated with 0.3% DF+. After 39 days of treatment, before the finisher feed was given, 10 birds from each of the 3 treatments were taken for further microbial analysis and were screened for Salmonella. The collected data were analysed with ANOVA by the StatisticsXL program. A $P<0.05$ value was considered to be a significant result.

In vitro study

Table 1 shows the log reduction in SE counts after application of sodium diformate at the manufacturer's maximum recommended dose (0.6%) to samples of crop or caecal contents; this dosage was used for the laboratory test. In practice lower dosages are used. There, and especially in broiler production the recommended dosage for an anti-Salmonella effect lies at 1-2 kg/t.

Table 2. Reduction in Salmonella enteritidis (log10) over time in crop or caecal content treated with 0.6% DF+ (after Wales et al., 2013).

	1 h	4 h	8 h	9 h	24 h
Crop contents	3	>6	>6	n.d.*	n.d.*
Caecum contents	1	1	n.d.*	2	4

*not determined

In the crop, exposure of inoculated crop contents to DF+ resulted in a log 3 reduction in SE counts after 1 hour, reducing further to >log 6 at both 4 and 8 hours. Anti-Salmonella activity in the crop, by rapidly reducing the crop pH and killing Salmonella, may be particularly suited to combating the ingested pathogen from various contamination

vectors (feed, environment, litter, etc.).

In caecal contents, only log 1 reduction in SE count was observed after 1 hour incubation, reducing further to log 2 reduction after 9 hours, compared to the negative control. This effect was further pronounced after 24 hours' incubation, with a reduction in SE count of log 4. Since the retention time in the hindgut of chickens is significantly longer, compared to the 'foregut' (crop, gizzard, proventriculus), the reduction in SE count after 24 hours may allow for a continuation of protection against the pathogen. The strong results with a reduction of up to 6 logs (see table above) suggest that also a lower dosage will show significant results, since it has to be mentioned that a reduction by log 2 means already 99% lower Salmonella levels. This approach was used in the in vivo study below.

In vivo study

Results of the in vivo study are shown in Table 3 (Lückstädt and Theobald, 2009). No positive samples were found for Salmonella in the crop (P=0.15) or intestine (P=0.15) at 0.2% (the recommended commercial dose in case of a suspected pathogenic challenge).

Table 3. Results of sodium diformate (DF+) on Salmonella inhibition (% positive samples) in broiler chickens (after Lückstädt and Theobald, 2009).

Organs	Control	DF+ 0.3%
Crop (microbiol.)	20	0
Intestine (microbiol.)	20	0
Faeces (microbiol.)	25	0
Meat (serol.)	0	0

Further studies on the anti-Salmonella effect of DF+ were carried out in the Ukraine at the Animal Agriculture Institute of National Academy of Agricultural Sciences of Ukraine (2012). In that trial Cobb 500 birds were challenged with feed which contained 109 CFU/ml Salmonella Typhimurium (strain no. 371). The trial lasted for a period of 6 weeks. Organs of birds (heart, lung and spleen) as well as intestine and manure were tested for Salmonella in birds fed with (0.3%) or without DF+. After the trial the negative control had positive samples of Salmonella in all organs, the intestine, and the manure – whereas in the DF+ treated group the Salmonella was below the detection level.

The above stated trials are in-line with experience from users of DF+ in Europe and Asia. The product is used for its anti-bacterial action, against Salmonella or E.coli, for instance in Germany, UK and Spain – or if talking about Asia, e.g. in India or the Philippines. Here, customers use the recommended dosage for the anti-Salmonella effect of 3 kg/t as long as the thread of the bacteria is present. After that, the normal broiler dosage of 1-2 kg/t of finished feed is recommended.

However, it has to be stated that the currently reduced threat with Salmonella in Europe – latest figures from the EU zoonosis report (EFSA, 2021) report only 60.000 cases of Salmonellosis in humans (which is a reduction from more than 131.000 cases in 2008 – EFSA zoonosis report 2010) cannot be alone accounted for the use of acidifiers like DF+, but has to be seen as a combination of increased biosecurity and improved management in general, which includes however the use of additives with anti-Salmonella action.

Acidomix DF+ Helps to Improve Productivity in Layers.

A meta-analysis on its impact on broiler performance in Eastern Europe is available. However, its impact in layer production systems there was yet to be thoroughly investigated.

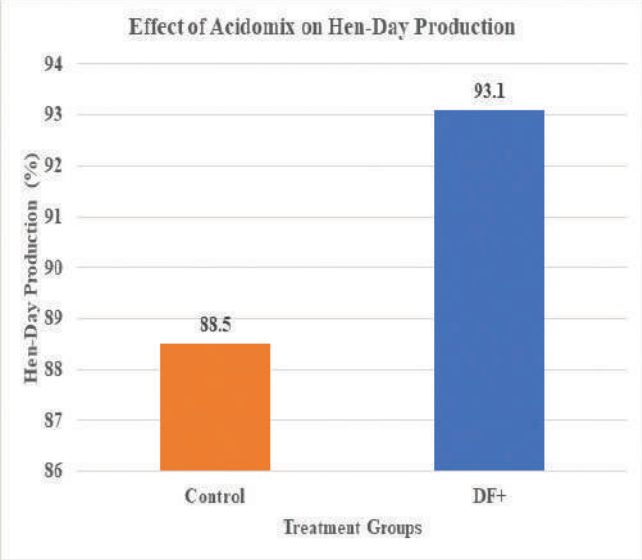
This study analysed the average impact from all studies carried out in Eastern Europe on the effect of the additive on the laying rate of Lohmann Brown hens. The final dataset contained the results of 6 trials with DF+-inclusion, which ranged from 0.1% to 0.15%. The total number of layers used in the trials was more than 200,000 and the bird age ranged from 48 to 78 weeks. Results of the meta-analysis are expressed as percentage difference

from the negative control. A P<0.05 value was considered significant.

The average level of dietary DF+-inclusion from the dataset in all treated layers was 0.14%. The performance of layers based on hen-day (HD) percentage was significantly increased by 5.4% (P=0.002), from 88.5% HD in the negative control to 93.1% HD in the DF+-groups. Furthermore, the uniformity was improved in the treated group (Table 4).

Table 4: Effect of Acidomix DF+ (DF+) on the hen-day percentage of Lohmann Brown hens (Meta-analysis based on 6 trials).

Control	DF+	Difference (%)	P-value	Age in weeks
88.5±2.9	93.1±1.0	5.4±2.6	0.002	59.5±10.5

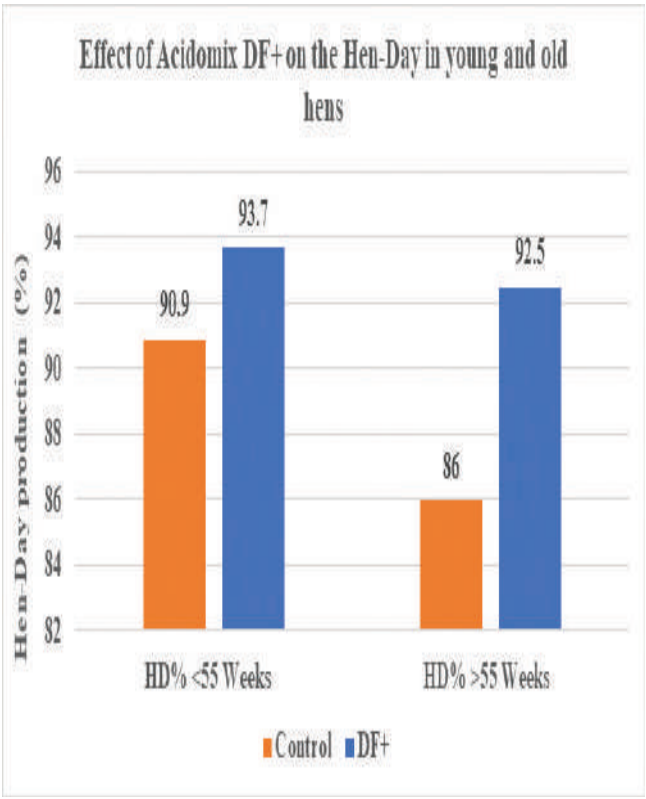


Graph 1: Comparative analysis of hen-day production (%) in control and DF+ treatment groups in Lohman Brown layers.

A significant difference (P=0.02) in performance was noted between younger and older hens (Table 5): birds less than 55 weeks of age had only an improvement of 2.0% (P=0.02) against the negative control; hens above 55 weeks of age achieved a highly significant improved HD percentage of 7.7% (P=0.007).

Table 5: Effect of Acidomix DF+ on the hen-day percentage (HD%) of young (<55 weeks) and old (>55 weeks) hens.

Age in weeks	Control	NADF	Difference (%)	P value
HD% <55 Weeks	90.9±1.1	93.7±0.8	3.0±0.9	0.019
HD% >55 Weeks	86.0±1.8	92.5±0.8	7.7±1.5	0.007



Graph 2: Comparative analysis of effect of Acidomix DF+ on hen-day production (%) in young and old hens.

Conclusions:

Above studies clearly indicate the huge benefits of using organic acids (Acidomix DF+) in broilers as well as layers. Some of the key take aways from these studies are as follows:

A. Inclusion of Acidomix DF+ showed significant increase in weight gain in broilers compared to control groups.

B. Inclusion of Acidomix DF+ showed significant decline in %mortality and FCR in broilers compared to control groups.

C. Acidomix DF+ inclusion showed significant reduction of Salmonella in crop and caeca

of the birds conferring long term protection against Salmonella in vitro as well as in vivo.

D. Inclusion of Acidomix DF+ showed significant increase in hen-day production in late lay (post 55 weeks) stage.

NATIONAL EGG CO-ORDINATION COMMITTEE

DAILY/MONTHLY EGG PRICES SUGGESTED BY NECC AND PREVAILING PRICES AT VARIOUS PRODUCTION CENTRES (PC) AND CONSUMPTION CENTRE (CC)

JANUARY-2024

2023 Dec.																																
Name Of Zone / Da	**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**	**Average**
NECC SUGGESTED EGG PRICES																																
Ahmedabad	636	639	642	642	642	642	630	630	630	630	605	605	605	605	605	595	585	585	585	585	585	590	590	590	590	590	590	590	-	-	-	608.5
Ajmer	620	620	610	610	606	606	606	606	596	580	570	570	-	560	560	560	550	550	550	568	573	573	573	563	535	-	542	-	-	-	-	578.28
Barwala	606	606	606	606	606	580	580	580	580	580	568	568	568	568	548	548	548	548	548	560	568	570	570	570	535	535	540	540	-	-	-	568.93
Bengaluru (CC)	615	615	615	615	615	590	570	575	575	575	565	565	565	565	565	550	550	550	550	550	555	-	565	570	570	570	570	570	-	-	-	574.26
Brahmapur (OD)	610	610	610	610	610	610	610	585	585	585	585	580	580	580	573	573	550	550	550	557	567	575	578	578	563	563	563	563	-	-	-	580.46
Chennai (CC)	615	615	615	615	615	605	590	590	590	590	580	-	570	570	570	-	570	570	555	555	555	555	570	570	580	580	580	580	-	-	-	582.69
Chittoor	608	608	608	608	608	598	583	583	583	583	573	-	563	563	563	-	563	563	548	548	548	548	563	563	573	573	573	573	-	-	-	575.69
Delhi (CC)	645	645	645	645	640	650	630	630	620	620	620	610	610	610	600	585	570	570	570	575	595	600	600	600	600	600	600	600	-	-	-	610.18
E.Godavari	580	585	585	585	585	585	585	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	540	-	-	-	557.32
Hospet	575	575	575	575	575	550	530	535	535	535	525	525	525	525	525	510	510	510	510	510	515	-	525	530	530	530	530	530	-	-	-	534.26
Hyderabad	579	582	582	582	582	560	560	560	560	540	540	540	-	540	520	520	520	520	523	526	531	536	540	540	540	540	540	-	-	-	-	546.27
Jabalpur	610	615	615	600	585	585	585	585	585	585	560	560	-	560	560	540	540	540	540	540	560	575	575	575	555	555	555	-	-	-	-	570.77
Kolkata (WB)	650	650	650	650	650	650	650	650	625	625	615	615	615	605	595	585	585	585	585	610	630	630	630	600	600	600	600	600	-	-	-	619.11
Ludhiana	610	610	610	610	595	595	580	580	580	580	580	-	-	-	-	-	-	547	547	547	565	569	569	569	569	535	535	539	-	-	-	573.68
Mumbai (CC)	645	645	650	650	650	650	630	620	620	620	600	600	600	600	600	590	580	580	580	583	586	593	601	605	605	605	605	-	-	-	-	610.85
Mysuru	615	615	615	615	615	590	570	575	575	575	565	-	565	565	565	550	550	550	550	550	555	562	567	572	572	572	572	572	-	-	-	574.59
Namakkal	565	565	565	565	565	545	525	525	525	525	515	515	515	515	515	505	505	505	505	505	505	510	515	520	520	520	520	520	-	-	-	525
Pune	650	650	650	650	650	640	620	610	612	612	612	610	605	600	600	600	590	590	585	585	590	595	603	603	603	603	603	603	-	-	-	611.57
Raipur	600	600	600	590	580	580	565	565	565	580	560	560	-	550	550	545	545	545	545	545	555	565	565	565	550	540	540	-	-	-	-	563.46
Surat	640	640	643	643	643	635	620	620	620	620	600	600	600	600	600	580	580	580	580	580	585	590	590	590	590	590	590	590	-	-	-	604.96
Vijayawada	580	585	585	585	585	585	585	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	540	-	-	-	557.32
Vizag	625	625	625	625	625	625	625	625	625	625	599	599	599	599	599	599	564	550	550	550	555	560	563	565	565	565	565	565	-	-	-	591.46
W.Godavari	580	585	585	585	585	585	585	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	540	-	-	-	557.32
Warangal	**581**	**584**	**584**	**584**	**584**	**562**	**562**	**562**	**562**	**542**	**542**	**-**	**-**	**-**	**-**	**-**	**-**	**522**	**525**	**528**	**533**	**538**	**542**	**542**	**542**	**542**	**-**	**-**	**-**	**-**	**-**	**553.15**
Prevailing Prices																																
Allahabad (CC)	671	676	676	662	652	638	619	610	610	610	610	610	610	610	610	595	586	576	571	595	619	629	629	609	595	595	595	586	-	-	-	616.21
Bhopal	615	620	620	620	620	620	625	625	625	590	570	570	-	-	570	550	540	540	540	540	550	560	570	570	570	560	560	-	-	-	-	581.6
Indore (CC)	600	610	615	615	610	600	600	600	590	580	570	570	-	560	550	550	550	550	550	550	560	565	570	570	540	540	545	-	-	-	-	573.46
Kanpur (CC)	652	652	652	652	642	642	633	633	624	624	614	614	614	614	614	595	595	586	586	586	609	609	609	609	595	595	595	581	-	-	-	615.21
Luknow (CC)	683	683	683	683	667	667	667	667	660	660	650	650	650	650	650	633	633	633	617	617	650	650	650	650	650	633	633	633	-	-	-	651.86
Muzaffurpur (CC)	670	670	670	670	665	640	640	640	640	640	630	630	630	630	610	610	610	610	610	625	630	630	630	630	601	601	601	601	-	-	-	630.86
Nagpur	600	600	600	600	600	600	600	600	590	590	577	565	-	-	-	540	-	540	540	540	563	563	563	555	540	-	555	-	-	-	-	573.68
Patna	670	670	670	670	665	640	640	640	640	640	630	630	630	630	610	610	610	610	610	625	630	630	630	630	601	601	601	601	-	-	-	630.86
Ranchi (CC)	667	667	667	657	657	642	642	638	629	629	629	619	619	619	619	609	605	605	605	609	619	619	619	609	609	600	600	600	-	-	-	625.29

AAHP-2024

5th Biennial Poultry Health Conference and National Symposium on
"Poultry Health : Current Challenges and Future Strategies"
23-24 February 2024, Hyderabad, India

The V Biennial Poultry Health Conference of the Association of Avian Health Professionals (AAHP) and National Symposium (AAHP-2024) is being organized by ICAR-Directorate of Poultry Research, Hyderabad and AAHP during 23rd-24th February, 2024. The theme of the conference is ***"Poultry Health: Current Challenges and Future Strategies"*. The venue is at the Auditorium of PJTS Agricultural University, Rajendranagar, Hyderabad**.

A comprehensive scientific program, scientists-industry interface and plenary session have been scheduled for this conference. Broadly, the deliberations would be on emerging and re-emerging poultry diseases, vaccines, antimicrobial resistance, gut health, mycotoxins, biosecurity, disease control and food safety. A modest gathering of about 300-350 delegates and officials are expected to participate in deliberations. Eminent speakers from abroad and from India in the field of poultry health are identified for the conference.

AAHP cordially invite poultry health scientists, researchers, veterinarians from Government and private organizations, industry personnel, farmers, policy makers and students to participate in this crucial event for exchanging scientific and technical knowledge and further, interact with eminent scientists and industry experts in the field of poultry health, welfare and food safety. The Conference will facilitate knowledge dissemination of great interest and vivid scientific discussions, as well as stimulate a creative exchange of ideas.

Registration

Category	Before 31st January 2024	After 31st January 2024 & spot registration
AAHP Life members	Rs 5000	Rs 5500
Non AAHP members	Rs 6000	Rs 6500
Students	Rs 3000	Rs 3500
Foreign delegate	USD 100	USD 125

QR Code. UPI ID: icardpr840@sbi

Contact
Dr M R Reddy,
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Comprehensive Winter Management Strategies for Poultry A Guide for Diverse Settings

Dr Roshni Chand, M.V.Sc. Scholar, Division of Animal Genetics and Breeding, ICAR- IVRI, Izatnagar, 243122 drchandvet111@gmail.com; Dr Nitish Gaitri, M.V.Sc. Scholar, Division of Animal Genetics and Breeding, ICAR- IVRI, Izatnagar, 243122, niti.nitish.10@gmail.com; Dr Jyoti Palod Professor, Department of LPM, GBPUAT, Pantnagar, 263145 palod_jyoti17@rediffmail.com; Dr Pushpendra Kumar, Principal Scientist, Division of AGB, ICAR- IVRI, Izatnagar, 243122 pushpendra64@gmail.com

Abstract

Poultry farming plays a crucial role in ensuring a sustainable and efficient agricultural production. From eggs to meat poultry is a highly valued enterprise with Indian market size of INR 1,905.3 billion in 2022 which is expected to reach INR 3,477.8 billion by 2028 at a CAGR of 10.18% (IMARC). However, winter presents several challenges to poultry management, affecting various aspects of bird health, behavior, and overall management. Additionally, winter conditions can disrupt laying hen's reproductive physiology, affecting egg production. This article gives a comprehensive review of challenges faced during winter and also highlights strategies for an effective winter management for profitable poultry farming. It highlights necessity of adequate housing, ventilation, litter, feed, water, and brooder management. Also, it throws light on importance of feed and water management strategies to meet increased energy demand and decreased water intake during winter. It stresses upon the fact that brooder management is also essential for providing the necessary heat for newly hatched chicks. Finally, it notifies importance of proactive health and disease management, including monitoring for illness, vaccination, and swift action for maintaining flock health.

Poultry refers to domesticated species of birds that are raised primarily for meat and eggs. Poultry farming is a significant aspect of agriculture, serving as a source of protein-rich food products for human consumption. These birds are commonly housed in regulated environments, whether on farms or in backyard settings, with meticulous attention given to managing their diet, living conditions, and overall health (USDA). According to India's National Bureau of Statistics, the country had the world's second-largest poultry population, reaching around 851.51 million birds in 2019-20 (21st livestock census- DAHD). During the same period, India produced 10.32 million metric tons of eggs, contributing to approximately 7.5% of global egg production. Despite crop production increasing at a rate of 1.5 to 2 percent per annum, egg and broiler production in India has surged at a rate of 8 to 10 percent per annum. Consequently, India has become the world's third-largest egg producer (FAO).

Winters are marked by harsh climatic conditions with temperature dropping too extreme low. Both humans and animals bear burnt of harsh winters. Like other animal farming practices winter poses several challenges to poultry farming, affecting various aspects of bird health, behavior, and overall management. Poultry are social animals that establish a pecking order within the flock. Their normal body temperature ranges between 105 to 107.5 °F (40.5 to 42.5 °C). Being warm-blooded animals they need to maintain this internal body temperature during all conditions of environment for survival and production, therefore their management during adverse environment conditions becomes a necessity for profitable poultry farming.

Why winter management?

Poultry are vulnerable to severe cold, causing cold stress that influences metabolic rate, feed intake, and growth, potentially affecting health and productivity.

Winter's shorter daylight disrupts laying hens' reproductive physiology, leading to reduced egg production, impacting profitability. Freezing temperatures result in water sources freezing, risking dehydration and affecting feed consumption. Adequate ventilation in poultry houses is crucial to prevent moisture buildup and reduce respiratory issues caused by winter condensation. The increased energy demand in cold weather may require feed adjustments, thus increasing production cost. Cold and damp conditions in winter heighten the risk of disease transmission, necessitating enhanced biosecurity measures. Restricted outdoor activities lead to indoor overcrowding, causing stress and susceptibility to diseases. Frostbite and hypothermia risks increase, particularly for young or weak birds with exposed combs, wattles, and extremities. Cold temperatures impact feed storage and quality, posing challenges for nutritional intake. Maintaining optimal temperatures in winter requires heating systems, contributing to increased operational costs. Winter conditions present challenges for egg incubation, with stable incubator temperatures crucial, and power outages during winter storms disrupting the incubation process. Temperature below 60ºF, decreases egg production, water intake, fertility, hatchability etc. and may lead to hypothermia, frostbite or death. Therefore, winter management has key role for profitable poultry farming.

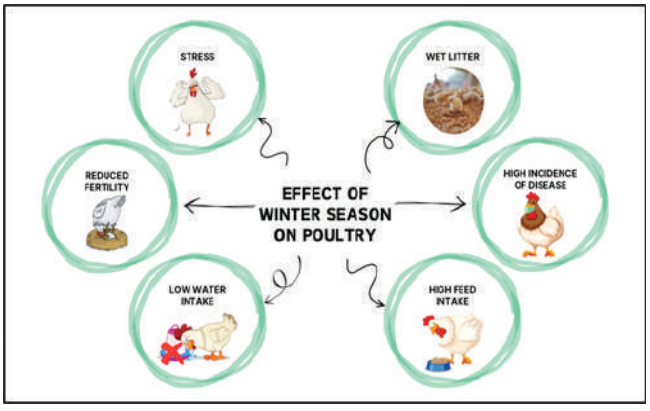

Fig.1.0 - Effect of winter season on poultry

Housing management

Poultry houses should be designed in a way such that birds are able to freely express their natural behaviour. Rectangular houses should be oriented in east to west direction to have maximum sun exposure during daytime and minimum wind exposure during night hours. Gunny bags, feed bags, plastic sheets, bamboo curtains can be used as wind breaks during night. Slopy roofs prevent snow and water accumulation and are useful in hilly areas. Mud and cow dung covering of walls also helps in insulation. External heat sources viz- heaters, bulbs, bukhari help to maintain temperature. Further solar panels can be used to harness solar energy and use for heating during night hours for sustainable poultry farming. In brooding room, 32-34°C temperature should be maintained by arranging bulbs at a distance of 1.5 feet from ground for 300-400 chicks in 300 sq feet area.

Ventilation

Optimal conditions in winter poultry farming are crucial for bird well-being and sustained productivity. Adequate ventilation, facilitated by tools such as sliding windows and exhaust fans, is essential to prevent respiratory issues arising from ammonia production and release of moisture through bird's breath and droppings. Increased levels of ammonia can harm the respiratory cilia, which are responsible for removing debris from the trachea. This damage may result in birds being more susceptible to viral infections such as Infectious Bronchitis, Infectious Laryngotracheitis, and Newcastle's Disease. Early attention to the initial 24-48 hours of a bird's life and continuous adjustments in ventilation and heating throughout winter are necessary to combat challenges like moisture buildup. Effective insulation and sealing of the shed play a pivotal role in maintaining winter ventilation, with fans operated at minimal capacity to retain maximum heat.

Adjusting ventilation rates based on bird age, and supplementing heat as needed, ensures a balanced environment. Careful litter management, including monitoring for dustiness and respiratory problems, is imperative, and proper mixing of fresh and warm air is emphasized. HVAC (Heating, Ventilation, and Air Conditioning) systems can be used to maintain a comfortable indoor environment to reduce energy consumption by optimizing heating and cooling usage. Additionally, maintaining a recommended light duration of 14-16 hours is crucial for laying birds during the winter months to counteract natural molting and sustain production levels.

Litter Management

The bedding material used for providing comfort to chicks and older birds is known as litter. An effective litter material not only maintains a consistent temperature but also absorbs moisture, aiding in drying and reducing contact between birds and fecal matter. Additionally, it acts as insulation against the cooling effects of the ground, creating a protective barrier between the birds and the floor. During winter, a recommended 6-inch layer of litter offers warmth to the birds, contributing to their well-being. Efficient litter management is crucial to prevent issues caused by water from loose connections, drinkers, droppings, and roof leaks, which can lead to cake formation in the litter and a favourable environment for anaerobic bacterial growth and ammonia production. The damp bedding and moist surroundings create an ideal setting for intestinal pathogens such as Coccidia, Clostridium and E. coli., which may cause polyserositis, septicemia and death.

Avoid completely emptying the poultry shed during winter, as accumulated litter helps retain heat. If necessary, only remove a portion of the bedding to maintain a comfortable environment. Maintaining litter moisture within the optimal range of 25-35% is essential, and continuous monitoring of heating and ventilation systems ensures appropriate humidity levels. Quality feed and water play a role in preventing litter wetting, feed rich in wheat and barley and water high in minerals contributes to softer droppings and adds moisture to litter. If the litter becomes excessively wet and forms cake, timely replacement is recommended. Foul odors, often a concern in farms near populated areas, can result from wet litter. However, keeping the litter dry and implementing an efficient ventilation system helps address this issue, also maintaining a balanced pH level is crucial for organic matter degradation. Proper litter management is thus integral to maintaining a healthy and comfortable environment for poultry, with considerations for moisture control, ventilation, and odor prevention.

Feed Management

Poultry relies on feed for energy to maintain body temperature and carry out physiological activities, as well as for building materials for growth and production (bones, flesh, feather, egg). In colder weather, there is a smaller variation in feed consumption for each degree change compared to hot weather. The low temperature increases feed intake and oxygen demand, necessitating ample food for chickens to meet the extra energy requirements for body temperature maintenance. Caloric intake per bird per day varies with ambient temperature changes. During winter, it's advisable to increase the number of feeders compared to summer, and feed should be available to the birds throughout the day. To prevent nutrient wastage when birds consume more feed, especially during winter, energy-rich sources like oil/fat should be added to the diet, or other nutrient levels may be reduced while maintaining the same energy level. For optimal broiler growth, a diet with 23% protein and 3100 Kcal ME/kg is needed during summer, whereas in winter, 3400 Kcal/kg ME and 23% protein are required.

Elevating amino acid levels, supports better feed conversion ratios, higher growth rates, and increased breast meat yields. Amino acid density becomes a matter of economic priority, as it increases water intake, excretion, and nitrogen deposition in litter. Store poultry feed in a dry area to prevent exposure to moisture, ensuring the feed's quality and nutritional value are preserved. Thus, effective feed management during winter in poultry farming is essential for maintaining optimal bird health and productivity.

Fig.2.0 - Management of poultry in winters

Water Management

Water is an essential nutrient necessary for birds, serving vital functions such as transporting nutrients, facilitating chemical and enzymatic reactions, regulating temperature, and lubricating joints and organs. In the winter season, birds tend to consume less water, emphasizing the need for a consistent supply of fresh water to maintain their hydration. It is crucial to provide clean and fresh water, and if the water is cold, it should be tempered with hot water to achieve a suitable temperature for the birds. In regions prone to ice formation, inspecting pipelines regularly during temperatures below 0°C is necessary to prevent water blockages caused by freezing. Given that water consumption decreases in winter, special attention is required when administering vaccines, medicines, or stress-relieving vitamins through water. Waterers should be removed a few hours before medication to ensure birds consume the full dose, and medications or supplements should be administered in reduced water amounts to guarantee each bird benefits from the treatment during this period of reduced water intake.

Brooder management

A newly hatched chick lacks fully developed thermoregulatory mechanism and typically takes around two weeks in summer and 4-6 weeks in winters to establish this mechanism and achieve homeostasis, therefore artificial aid becomes necessary for chicks up to 4-6 weeks of age. This artificial process of providing heat and other management to baby chicks is called brooding. Brooding can be natural i.e. by broody hen or artificial by use of brooders.

Fig. 3.0 - Natural brooding

Brooder type depends either on energy source or material they use to brood the chicks viz. Electric brooder- (Hover, Heater), Battery brooder, Gas brooder, Kerosene brooder- Lamp or Stove type, Coal brooder, Hot water system brooder and Infra-red Brooder etc. Hover brooders, designed for locations with constant electricity, utilize a 100 or 200-watt bulb to maintain a consistent temperature. Despite their convenience, these brooders may not sufficiently heat the space in extremely cold weather, potentially

leading to wet litter issues and necessitating frequent litter renewal. Infrared brooders employ lamps positioned 20-25 inches above the litter to warm chicks without affecting the room temperature. A single 250-watt infrared bulb can provide warmth for 60-70 chicks. Central heating systems, commonly used in large commercial operations in temperate countries circulate heated air or water through pipelines beneath buildings to ensure warmth. Gas brooding relies on LPG or bio gas for heat generation, with the heating element suspended 3-4 feet above chick level. Kerosene or charcoal stoves are employed in areas without electricity. Covered with a plate for heat dissipation, proper ventilation is crucial to eliminate toxic gases.

Infra- Red lamp

Radiant Gas brooder

Hover Type Kerosene -lamp brooder

Fig.4.0 -Various types of artificial brooders

Brooder house should be at a minimum distance of 100m from other poultry houses. It should be cleaned 7-10 in advance and heated before the entry of chicks. The use of LPG-operated Gas Brooders offers more consistent heat compared to traditional methods like Electric Lamps, Coal, or Wood. Before chicks arrive, ensure filled LPG Gas Cylinders are on-site.

The initial brooding temperature begins at 95°F (35°C). Optimal outcomes are achieved when the temperature is maintained at 33°C for the first two or three days, gradually decreasing by 5°F or 3°C each successive week until reaching room temperature at 70°F or 21°C. Improper brooder temperatures

(either too high or too low) can hinder chick growth and performance. In cold conditions, clustering may occur, risking fatalities from piling. Conversely, in high temperatures, chicks may move away from heat, resulting in poor feather growth and potential heat-related fatalities. Sensors connected to individual Gas Brooders or the Central Control System to monitor temperature may be used. Several A.I. and M.L. based devices are nowadays available for automated temperature recording and regulation.

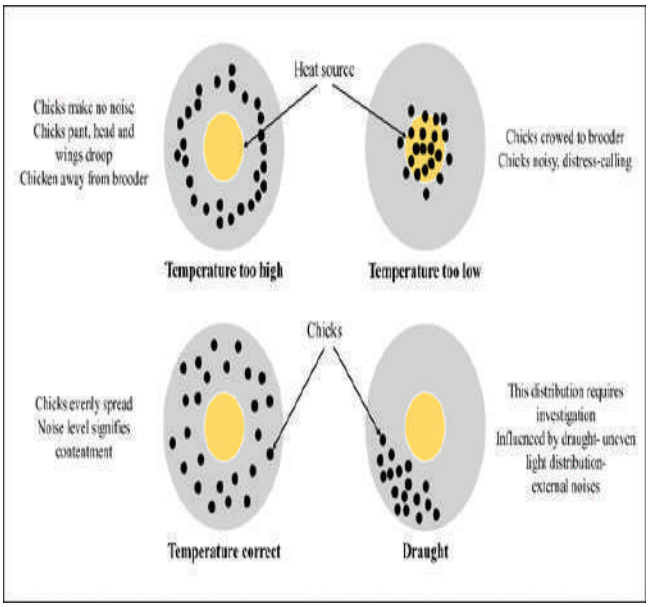

Fig.5.0 – Bird distribution under brooders

Litter depth should be 2-4 inches from ground. Additionally, brooder guards should be used.Brooder guards help chick to stay near the heat source until they learn to do so by themselves. It can be made of cardboard sheet, GI sheet, wire mesh, and mat or materials that can be effectively sterilized. The height of the guard is maintained at approximately 1.5 ft and it spans a diameter of 6 ft. These guards play a crucial role in keeping chicks close to the heat source, thereby aiding in the prevention of chilling and piling.

Fig.6.0- Hover type brooder with metal sheet guard rails.

Health and disease management

While winter illnesses in poultry are generally uncommon, they can escalate if not addressed promptly. Monitor the birds closely for any signs of illness and take swift action if needed. Keep track of the vaccination status of your birds and administer necessary vaccinations as per the recommended schedule. This proactive approach helps in preventing potential illnesses. Follow standard procedures for treating illnesses, which involve isolating the affected bird and administering appropriate medications. Diseases like colibacillosis, fowl cholera, mycoplasmosis, and ascites may be encountered during winters. Common antibiotics such as Enrofloxacin can be administered through feed or water. Vitamin-B complex, vitamin AD3E, calcium, and vitamin D are employed to counteract deficiency diseases. Additionally, electrolytes and vitamin C can be administered to protect birds from heat stress. Whenever birds get ill, expertise of a local veterinarian should be taken promptly. Professional advice ensures accurate diagnosis and appropriate treatment, contributing to the overall health and well-being of the flock.

Conclusion

Poultry farming has a pivotal role in food security as well as agricultural economy.

Winter poses a grave threat and may paralyze poultry market if management is improper. This guide addresses the challenges posed by harsh winter conditions and emphasizes proactive measures for optimal poultry well-being. During winters houses should be prepared before entry of chicks by brooders, heaters, saw dust bukharies, bulbs etc. to a temperature of 95°C. Exhaust fans, sliding windows, litter raking etc. helps in ventilation. Feed should be high in energy and minerals as birds eat less during winters. Water should be lukewarm and available round the clock. Birds should be vaccinated against all susceptible micro-organisms. Proper quarantine and treatment protocol should be followed for birds showing any signs of illness. If managed scientifically birds will express their natural behaviour and thrive rather than just survive, ensuring the sustained well-being and profitability of farmers from flocks.

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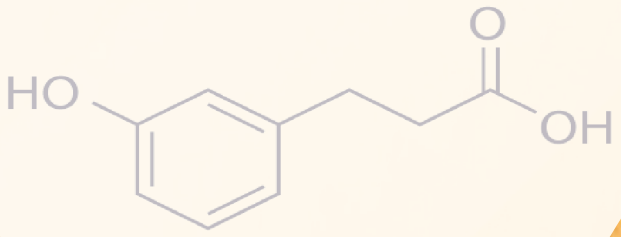

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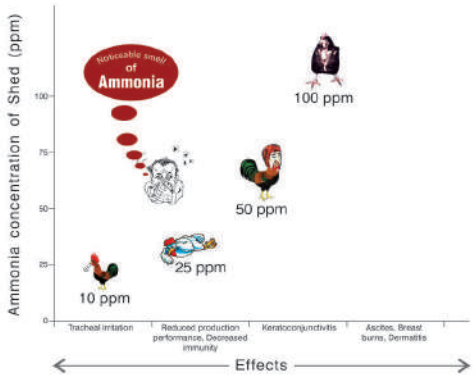

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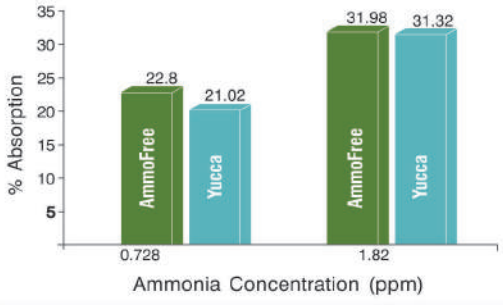
Effect of AmmoFree and Yucca extract on absorption of ammonia



Effect of AmmoFree* at broiler farm in winter (14° - 15°C) with noticeable ammonia concentration

Group	Livability (%)	Birds showing respiratory discomfort	Faecal NH3 (g/kg dry faeces)	
			Day 21	Day 42
Control	95.00	7	3.86	3.92 (+1.55%)
AmmoFree 200g/ton	96.67	X	3.95	2.71 (-45.75%)

Trial at Commercial Poultry Farm under technical guidance of Dr. Rama Subba Reddy

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Broiler Lifting Rates for the month of DECEMBER_23																															
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
Hyderabad	86	86	86	86	76	66	71	73	75	75	75	75	85	95	100	100	100	100	95	95	90	85	85	85	85	85	85	90	100	110
Karimnagar	86	86	86	86	76	66	71	73	75	75	75	75	85	95	100	100	100	100	95	95	90	85	85	85	85	85	85	90	100	110
Warangal	86	86	86	86	76	66	71	73	75	75	75	75	85	95	100	100	100	100	95	95	90	85	85	85	85	85	85	90	100	110
Mahaboobnagar	86	86	86	86	76	66	71	73	75	75	75	75	85	95	100	100	100	100	95	95	90	85	85	85	85	85	85	90	100	110
Kurnool	86	86	86	86	76	66	71	73	75	75	75	75	85	95	100	100	100	100	95	95	90	85	85	85	85	85	85	90	100	110
Vizag	69	69	69	69	59	59	64	66	71	74	74	77	82	87	92	92	92	92	92	92	92	92	92	92	92	92	92	97	107	109
Godavari	79	79	79	79	69	69	74	76	79	82	82	82	89	99	104	104	104	104	104	99	94	89	89	89	89	89	89	94	104	114
Vijayawada	79	79	79	79	69	69	74	76	79	82	82	82	89	99	104	104	104	104	104	99	94	89	89	89	89	89	89	94	104	114
Guntur	82	82	82	82	72	72	77	77	79	82	82	82	90	100	105	105	105	105	105	100	95	93	93	93	93	93	93	98	108	110
Ongole	82																													
Namakkal	75	75	77	77	72	74	76	76	76	76	76	79	86	96	98	100	100	100	100	94	96	98	99	101	101	101	92	92	93	97

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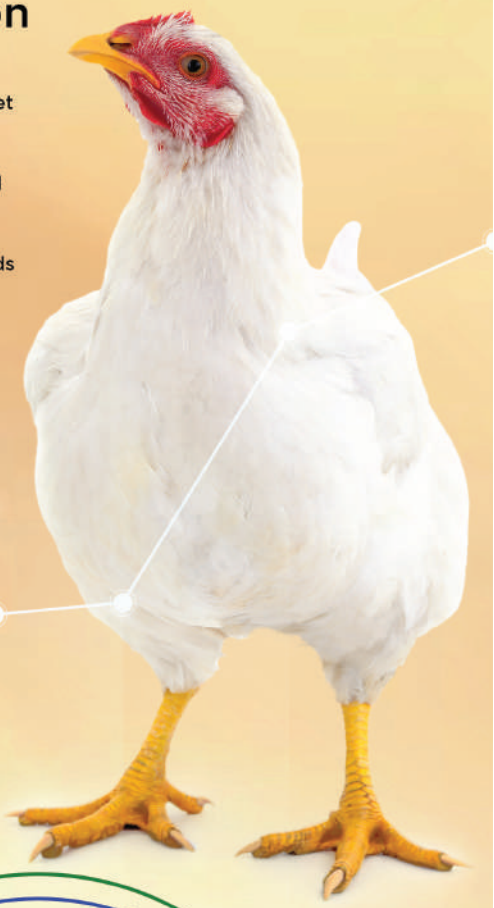

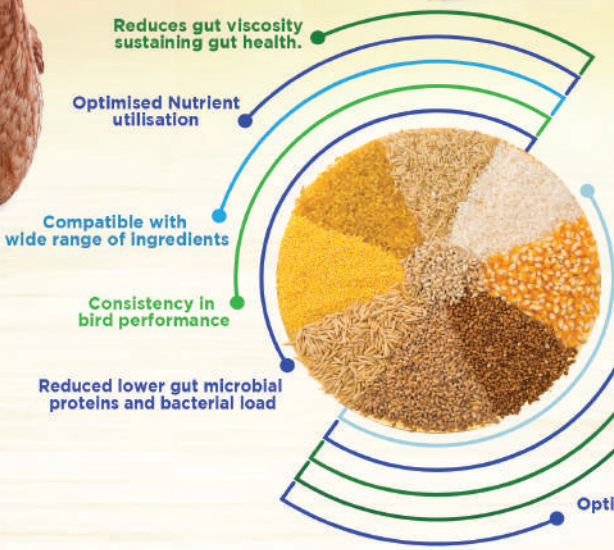

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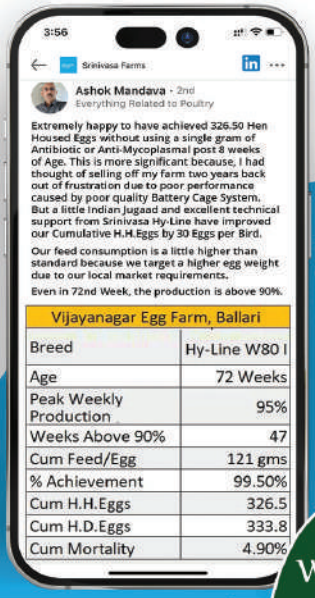

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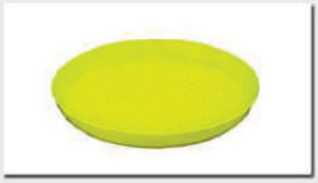
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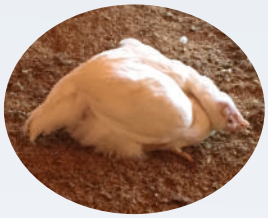

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