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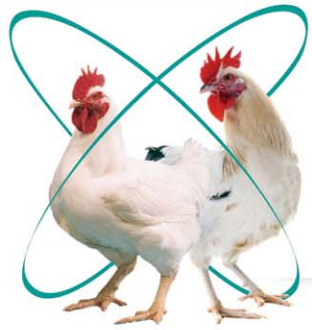

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INDEX OF ADVERTISEMENTS

PRESS RELEASE

Suresh Chitturi, the IEC Chairman, creates a milestone with great initiatives during the World Egg Day - Month Celebrations for the year 2020

The spread of COVID-19 has affected almost all spheres of human life. In India, we are all navigating through the pandemic crisis. Industries and businesses are grappling with this unforeseen crisis and challenges. IEC, under Suresh Chitturi's leadership hadaccomplishedthe mission to create maximum awareness on the goodness of eggs through various initiatives to drive the celebrations of World Egg Day month (9th Sept - 9th October). Srinivasa launched activities & multiple campaigns across the social media platforms to reach out to create awareness be it in building excitement through an Egg quiz that tested the knowledge of eggs, running an egg recipe contests that had seen many egg lovers sharing their own curated egg recipes, the inspiring egg infographic posts, expert blogs, celebrities and health experts egg endorsement videos have all garnered an incredible amount of engagement through their likes and shares by the audience setting a milestone.

The IEC Chairman, Suresh Chitturi, the egg champion undeterred and driven by his mission even in the pandemic times not leaving any stone unturned to make the nutrition of eggs more affordable and accessible to the millions across the globe with his unrelenting efforts of networking. Suresh led many insightful live webinars connecting

with the Industry leaders and health experts of national and international repute who shared their knowledge and experience with enthusiastic participantsacross a variety of key and relevant contemporary topics on increasing the awareness and importance of the eggs.

The World Egg Day month long celebrations concluded with the World Egg Day live webinar - “Egg, much more than the perfect protein- An Egg-ceptional Superfood”. with eminent speakers like Suresh Chitturi, Chairman of IEC (International Egg Commission) along with Tim Lambert, Former Chairman International Egg Commission & CEO, Egg Farmers of Canada, Dr. Raghav Sunil – MS Orthopaedics, and Sanjoy Mukerji – CEO, Indian Poultry Review, discussed case studies and shared business insights about the industry during this new normal, as we continue to fight COVID pandemic. They highlighted – egg as a healthy diet.

In his opening statement, Suresh Chitturi said ”The egg supply chain has remained strong in 2020. Even during the pandemic, egg farmers worked with gusto with their partners to deliver fresh, local, high-quality eggs to India. That’s why this World Egg Day, we’re expressing our appreciation for their contribution, and the importance of eggs. When it mattered most, they delivered, as we know eggs have been part of our food table for generations enriching our proteins requirement.”

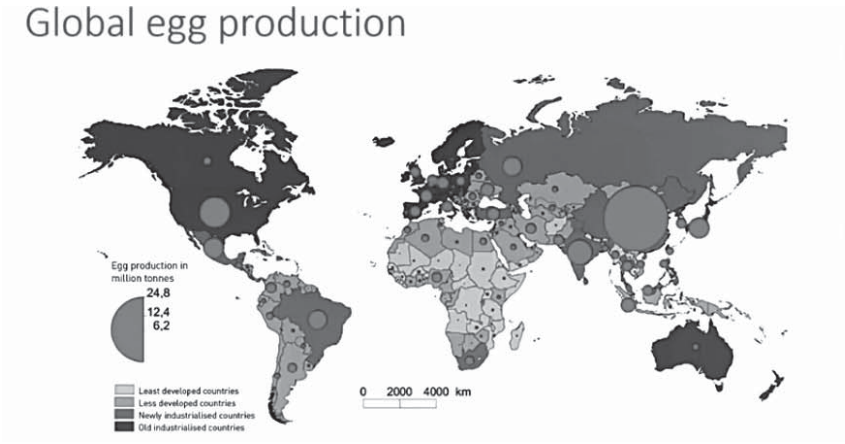
Tim Lambert, said “I believe the egg industry will continue its exponential growth in India, Asia and around the world, as we enhance the efficiencies, sustainability, at the farmer level to further grow the outreach of this efficient animal protein. Eggs have a positive impact on climate change. Eggs are a key part of diet they are also affordable animal protein. It is also relatively easy to produce and scale-up. We are working with Asian farmers to make egg production viable and sustainable.

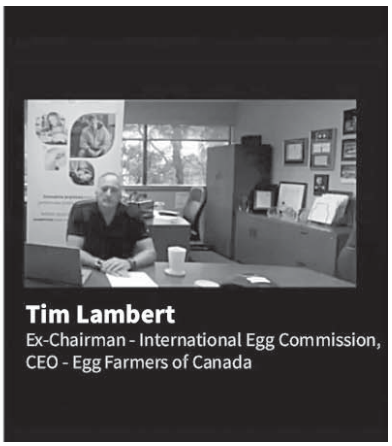
An interesting panel discussion among Suresh Chitturi, Dr. Raghav Sunil, and Sanjoy Mukherjee, about how “Egg, much more than the perfect protein- An Egg-ceptional Superfood”, discussed the importance to keep up immunity at a high level to fight COVID. A Q & A session followed by panel discussion had various questions from participants on egg consumption and egg being part of our healthy diet.

The highlight of the panel discussion had facts about the ability to tackle any health hazard that is related to immunity and nutritional level of one's body. Having an egg per day will give a sustainable protein of choice for consumers. With 6% of Vitamin A and 6.3 grams of protein in one egg, we consume just 75 calories, the egg is a super protein food for individuals who pursue fitness or maintain a healthy weight.

Studies demonstrate that eating eggs can lower the risk of heart disease in healthy people. Despite containing cholesterol, eggs contain high-density levels (HDL) or "good" cholesterol. Research shows that people with higher levels of HDL generally have reduced risks of heart disease.

Suresh who adores eggs himself said as an egg farmer I do raise awareness and educate others about the nutritional facts attached to eggs through my conversations on social media, and business networking events. As an Industry body, we also conduct from time to time activities including playing some games related to eggs, painting, decorating the eggshell, conducting online quizzes related to eggs, etc.





Applications of Genome Editing in Poultry Industry

Simran Singh[1], Dibyendu Chakraborty[2*], Nazam Khan[3] and Harshit Verma[4]

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Abstract: Poultry represents enormous significance to the agricultural industry. Application of Genome editing techniques such as Zinc Finger Nucleases (ZFNs), Transcription Activator-like Effector Nucleases (TALENs), and Clustered Regularly Interspersed Short Palindromic Repeats (CRISPR)/ CRISPR-associated protein 9 (Cas9) system can provide auxiliary strength through either production of novel markers or modification of the genome to introduce new traits. These techniques establish double-stranded DNA breaks (DSBs) and allow targeted genome editing. However, ZFN mediated gene editing in poultry is yet to be delineated. Prospects of gene editing in avian species has great significance for implementation in biomedical research, conservation, and agriculture, most applications to date have been concentrated on the poultry.

Keywords: *Poultry, Genome editing, ZFNs, TALENs and CRISPR/ Cas9 system*

Introduction

Significant changes in production, efficiency and product quality of both meat and eggs has been introduced through selective breeding but traits related to diseases and welfare are challenging to amend. However, genome editing provides the prospects for making modifications in these areas. Genome editing permits genetic material to be removed added or altered at specific locations in the genome thereby bringing changes in an organism. This also results in improving both the speed and accuracy of breeding.

ZFNs identify target sites that comprise of two zinc-finger binding sites that flank a 5 to 7 base pair (bp) spacer sequence recognized by the FokI cleavage domain (Gaj et al., 2016). On other hand, TALENs recognize target sites that involve two TALE DNA-binding sites that flank a 12 to 20 bp spacer sequence identified by means of the FokI cleavage domain (Gaj et al., 2016). . The Cas9 nuclease is aimed to target the DNA sequences complementary to the targeting sequence inside the single guide RNA (gRNA) positioned instantly upstream of a compatible protospacer adjacent motif (PAM) (Gaj et al., 2016). Genome editing tools have recently been applied in the chicken with both TALEN and CRISPR-Cas9 used to create targeted gene knockout chickens. However, ZFN mediated gene editing in poultry is yet to be reported.

The application of genome editing technology to create meticulous changes to the genome of avian species will provide avant-garde and exhilarating avenues for the biomedical, agricultural and biotechnology industries.

Sex Selection in Layer Chickens

Currently culling male chicks post-hatch engenders a key ethical conundrum for some countries. Sex selection effectively nullifies the demand to cull or grow out male chickens and leads to a more sustainable industry with a vision to secure future food security. By channelizing Genome editing technology to mark the sex determining chromosome, the males can be identified prior to hatching and erased during the incubation. The process utilizes a gene which specifically identifies only the chromosome that says “become male”, ensuing in only the male chickens being marked excluding the females (which go on to lay eggs). EggXYt (an Israeli biotech, 2019) is working on developing a gene edited breed of chickens whose sex can be determined prior to hatching by means of fluorescence imaging.

Reduce Poultry Vaccine Burden

In 2018, researchers at the Pirbight Institute in Surrey, England illustrated the use of CRISPR/cas9 gene editing system to introduce a gene of the IBD virus into the Marek’s disease vaccine virus which shields poultry against IBD in addition to Marek’s disease. This will considerably trim down the time required to generate new vaccine.

Genetically Engineered Eggs that Fight Cancer

In 2017, Japanese scientists from the National Institute of Advanced Industrial Science and Technology (AIST), the National Agriculture and Food Research Organization and Cosmo Bio. genetically customized precursor cells of chicken sperm to furnish a type of protein that's related to the immune system called interferon beta (a protein used to treat various illnesses, including multiple sclerosis and cancer). The immediate expectation is for the cancer-battling medicine to result in cost-effective medical products.

Genetically Engineered Hens that Produce Eggs from Different Breeds

In 2017, the University of Edinburgh's Roslin Institute in collaboration with the US biotechnology company Recombinetics used gene editing techniques to generate surrogate hens that lay eggs carrying genetic information of other breeds. It employs TALEN (transcription activator-like effector nucleases) to obliterate part of a chicken gene called DDX4 that is associated to fertility. Hens with this alteration did not produce eggs but were healthy in all other ways. This allowed the researchers to take out primordial germ cells (specialized cells) that led to the creation of eggs and embed them into eggs that would ultimately hatch into the genetically edited surrogate hens. Consequently, the hens would then mature to lay eggs (whatever breed they had been implanted with) thereby safeguarding rare poultry breeds from erosion in order to maintain future biodiversity.

Resistance against Avian Influenza Virus and Avian Leukosis Virus

The acidic leucine-rich nuclear phosphoprotein-32A (ANP32A) promotes avian influenza virus replication in both chicken and water fowl. However, deletion of a small segment of chicken ANP32A can avert replication of avian influenza virus in vitro (Long et al., 2016; Long et al., 2019).

Koslova et al. (2020) demonstrated CRISPR/Cas9-mediated a single amino acid deletion into the gene encoding the receptor that is required for Avian Leukosis Virus subgroup J to infect chicken cells. This confers the resistance of chickens to avian leukosis virus subgroup J.

Knockout chickens with Egg protein modification

Egg allergy is caused by 4 proteins within the egg white ovomucoid (Ovm- the most allergenic of the four proteins), ovalbumin (Ova), ovotransferrin and lysozyme (Dhanapala et al., 2015). Oishi et al. (2016) had reported the successful generation of a homozygous Ovm knockout female chick using CRISPR.

Conclusion: The chicken genome editing is gaining momentum with several avian research institutes adopting it. With swift progress in reference genome as well as the cost effectiveness of modern deep are sequencing subsequently resulting in increasing avenues to target regions of the avian genome for both industrial and research applications. This leads to enhanced effectiveness and unceasing poultry production to confront the challenges affiliated with global food security.

References

Dhanapala, P., De Silva, C., Doran, T. and Suphioglu, C. (2015) Cracking the egg: An insight into egg hypersensitivity. *Molecular Immunology,* 66:375-383.

Gaj, T., Sirk, S. J., Shui, S. I. and Liu, J. (2016). Genome-Editing Technologies: Principles and Applications. *Cold Spring Harb Perspect Biol.,* 8(12): a023754.

Koslová, A., Trefil, P., Mucksová, J., Reinišová, M., Plachý, J., Kalina, J., Kuèerová, D., Geryk, J., Krchlíková, V., Lejèková, B. and Hejnar, J. (2020). Precise CRISPR/Cas9 editing of the NHE1 gene renders chickens resistant to the J subgroup of avian leukosis virus. *PNAS*, 117 (4): 2108-2112.

Long, J. S., Giotis, E. S., Moncorgé, O., Frise, R., Mistry, B., James, J., Morisson, M., Iqbal, M., Vignal, V., Skinner, M. A., et al. (2016). Species differ-ence in ANP32A underlies influenza A virus polymerase host restriction. *Nature*. 529:101–104.

Long, J. S., Idoko-Akoh, A., Mistry, B., Goldhill, D. H., Staller, E., Schreyer, J., Ross, C., Goodbourn, S., Shelton, H., Skinner, M. A., Sang, H. M., McGrew, M. J. and Barclay, W. S. 2019. Avian ANP32B does not support in-fluenza A virus polymerase and influenza A virus relies exclusively on ANP32A in chicken cells. *bioRxiv*. doi: 10.1101/512012

Oishi, I.,Yoshii, K., Miyahara, D., Kagami, H., Tagami, T. (2016). Targeted mutagenesis in chicken using CRISPR/Cas9 system. *Sci Rep.,* 6:23980.

NATIONAL EGG CO-ORDINATION COMMITTEE

DAILY / MONTHLY EGG PRICES DECLARED BY NECC AND PREVAILING PRICES AT VARIOUS PRODUCTION CENTRES (PC) AND CONSUMPTION CENTERS (CC) OCTOBER 2020

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	31	Average
NECC Prices																																
Ahmedabad	555	565	571	574	576	576	576	576	555	555	555	555	555	555	555	530	530	520	522	525	530	535	538	543	546	546	546	546	546	535	525	548.94
Ajmer	537	541	545	547	547	540	515	520	528	533	535	525	520	515	505	505	505	507	520	535	535	527	538	538	538	538	525	527	505	505	-	526.7
Barwala	522	528	532	532	532	532	512	515	518	521	521	521	521	501	501	501	501	501	512	527	527	527	535	535	535	535	525	525	505	505	490	519.19
Bengaluru (CC)	530	545	550	550	550	550	550	550	530	530	530	530	530	530	530	505	505	505	505	505	505	510	525	525	525	525	525	525	510	510	510	525.97
Brahmapur (OD)	516	525	530	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	510	510	510	495	527.87
Chennai (CC)	515	525	540	550	550	550	550	550	530	530	530	530	530	530	530	510	510	510	510	510	510	520	535	535	535	535	535	535	520	520	520	528.71
Chittoor	508	518	533	543	543	543	543	543	523	523	523	523	523	523	523	503	503	503	503	503	503	513	528	528	528	528	528	528	513	513	513	521.71
Delhi (CC)	540	551	551	551	551	551	551	536	536	536	536	536	536	528	520	515	505	505	511	533	538	538	550	550	555	555	555	555	555	555	525	539.03
E.Godavari	516	521	526	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	515	505	527
Hyderabad	515	521	526	528	528	528	528	515	515	515	515	515	515	515	490	490	480	480	480	485	490	495	500	505	505	505	505	505	490	480	480	504.65
Ludhiana	517	524	528	530	530	530	530	522	522	522	522	522	516	510	510	506	502	502	505	517	528	528	528	536	536	536	536	525	520	520	512	521.68
Mumbai (CC)	558	570	576	581	583	583	583	583	560	560	560	560	560	560	560	540	540	530	530	530	535	540	545	550	555	555	555	555	555	540	530	555.55
Muzaffurpur (CC)	571	576	581	581	581	581	576	567	567	571	571	567	567	567	557	557	557	552	552	567	567	567	571	586	586	586	586	576	571	557	548	569.9
Mysuru	532	547	553	553	553	553	553	553	530	530	530	530	530	530	530	505	505	505	505	505	505	510	527	527	527	527	527	527	510	510	510	527.06
Nagpur	555	565	565	565	565	565	545	530	530	530	545	545	545	530	520	510	500	500	500	500	500	510	522	522	528	528	528	518	515	510	500	528.74
Namakkal	505	505	525	525	525	525	525	525	525	525	525	525	525	525	500	500	500	500	500	500	500	500	490	490	490	490	490	475	475	475	475	505.16
Patna	567	567	571	571	571	571	571	560	557	557	557	557	557	557	548	543	543	538	538	557	562	562	567	571	571	571	571	562	562	548	538	559.45
Pune	560	570	573	575	577	577	577	577	557	557	557	557	557	557	557	540	530	510	510	510	520	530	535	540	545	545	545	545	545	530	520	547.9
Ranchi (CC)	567	571	581	581	581	581	571	571	571	571	571	567	567	571	557	571	571	562	562	571	571	571	571	581	581	581	581	581	571	562	548	571.45
Vijayawada	516	521	526	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	515	505	527
Vizag	517	520	520	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	500	490	519.97
W.Godavari	516	521	526	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	529	515	505	527
Warangal	518	524	529	531	531	531	531	518	518	518	518	518	518	518	493	493	483	483	483	487	492	497	502	507	507	507	507	507	492	482	482	507.26
Prevailing Prices																																
Allahabad (CC)	571	571	571	571	571	557	548	548	538	538	538	533	533	533	529	529	529	514	514	524	533	548	552	552	552	548	538	524	524	533	524	541.55
Bhopal	556	556	565	565	565	558	555	558	560	538	538	542	542	535	521	521	515	515	515	510	520	525	526	526	526	526	528	528	528	528	515	535.68
Hospet	495	510	515	515	515	515	515	515	495	495	495	495	495	495	495	470	470	470	470	470	470	475	490	490	490	490	490	490	475	475	475	490.97
Indore (CC)	550	550	555	555	555	550	550	540	535	540	540	540	535	535	525	515	515	515	520	525	535	535	525	535	535	535	535	520	520	500	-	534
Jabalpur	550	552	558	552	558	550	542	537	540	540	542	542	542	542	542	520	510	510	510	520	523	525	531	531	531	531	531	531	531	521	511	534.06
Kanpur (CC)	543	562	562	562	562	562	562	543	543	543	543	543	543	543	543	543	529	529	529	552	552	552	562	562	562	562	552	552	552	538	529	548.9
Kolkata (WB)	561	566	571	571	571	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	573	558	558	558	570.74
Luknow (CC)	570	571	580	580	580	580	580	580	580	580	580	570	570	570	550	550	550	550	550	560	560	560	580	580	580	580	580	580	580	570	570	571
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Surat	585	595	600	600	600	600	585	585	565	565	565	565	565	565	565	540	540	530	532	535	540	545	548	553	556	556	556	556	556	546	536	562.26
Varanasi (CC)	570	573	580	580	580	581	567	567	567	567	567	567	567	557	550	550	550	550	550	567	567	567	577	577	583	583	583	573	573	563	548	567.77

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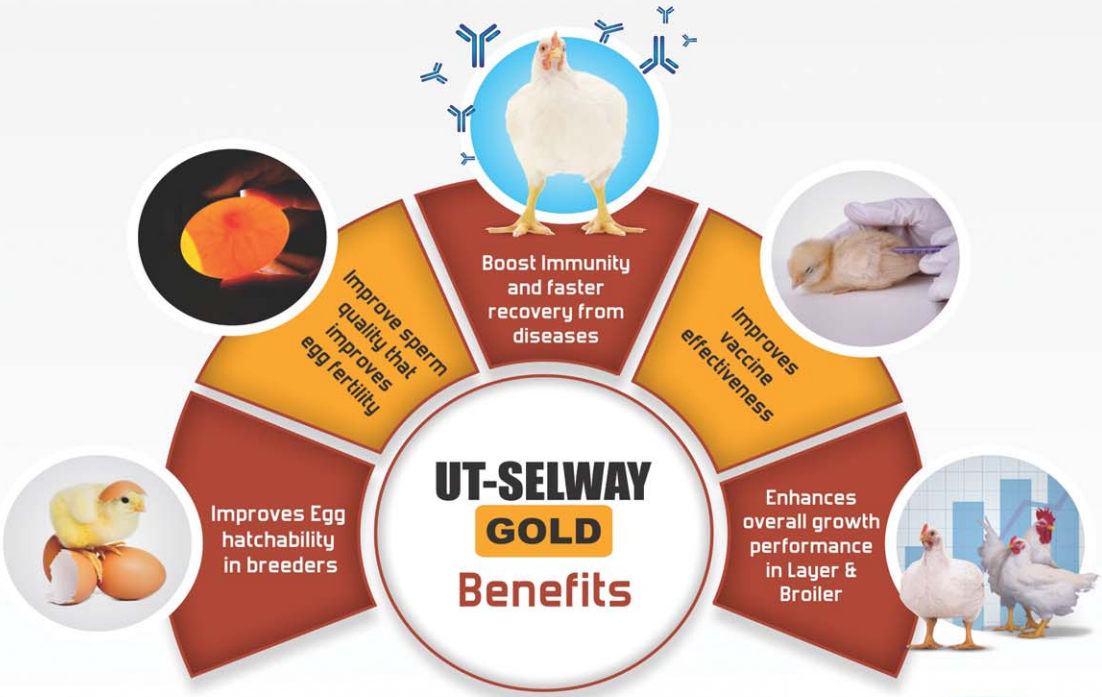

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Introduction: Discovery of antibiotics is one of the greatest benefits to mankind. Millions of lives have been saved across the world ever since the use of antibiotics came into practice. Initially the use of antibiotics was restricted only to humans, until the practice of intensive farming came into existence in the 1950'S and their routine use in animals for prophylactic purposes began. In 1963, the emergence of the first resistant bacteria was described (Watanabe et al., 1963). In 1969 a committee of government experts in the UK concluded that the use of antibiotics in animals had contributed to antibiotic resistance in humans. In 1975, further UK research linked the prolonged use of antibiotics to shedding of Salmonella typhimurium and its development of resistance to: Virginiamycin, Bacitracin, Flavomycin, Nitrovin, Tylosin, Sulphaquinoxaline, Ampicillin, Chloramphenicol and many more antibiotics. These resistant bacteria proliferate in the animal and are transmitted to other animals. Transfer of the bacteria from animal to human is possible through many routes. Humans can also get infected by eating meat from animals with resistant bacteria. In 2015, antibiotic-resistant pathogens were estimated to cause over 50,000 deaths a year in Europe and the USA. The toll is projected to rise to 10 million deaths per year worldwide by 2050 (O'Neill et al., 2016). Sensing trouble, some countries have already imposed a ban on the use of prophylactic antibiotics in livestock feed and many more are in the process. However, without the use of antibiotics in animal farming, the productivity of the animal is compromised and hence there is an absolute necessity to look into suitable replacements. The following review deals with the use of effective replacements to antibiotics in the form of diformates - the double salts of formic acid; phytogenic compounds and their efficacy against bacterial pathogens. Available data show that these substitutes not only effectively control pathogenic bacteria but also improve productivity far more effectively than antibiotics.

Review: Overuse of antibiotics, the development of resistant bacteria and its ill effects on the human population eventually leading to the ban on prophylactic use of antibiotics in animal farming, is currently the hottest topic of discussion everywhere. The ban on prophylactic use of antibiotics in animal farming is well deserved, however, looking at the bacterial challenges in the animal farming, it is imperative to have some kind of a tool to control the bacterial infections and improve the performance of the farmed animal. Organic acids are looked upon as the most promising alternative to the antibiotics (Papatsiros and Billinis, 2012), as in addition to its antimicrobial property, organic acids provide many extra benefits such as improving the intestinal health, optimising the intestinal pH and thereby improving the nutrient digestibility. Organic acid controls the development and growth of mold and bacteria by the virtue of its inherent antimicrobial property and are in use as a preservative in food industry since ages. Since half-a-century they also have been used in the animal industry, much of it to control the mold and bacteria in the feed, in order to improve the hygiene of the feed and thereby to improve the performance of the animal. The current article focuses more on to the role and advantages of organic acid in the control of pathogenic bacteria in the gastro-intestinal-tract (GIT) of chicken/swine.

The antimicrobial mode of action of organic acid is explained as a two-way action; one is the bacteriostatic effect by the dissociated molecule of organic acid, which inhibits the growth of microbes due to lowering of the pH in its surrounding area and the other is bactericidal action by un-dissociated molecule of organic acid which

occurs when the organic acid molecule penetrates through the cell wall of the gram-negative bacteria and then dissociates inside the bacteria altering the pH in the bacterial cytoplasm. Though this mode of action is well documented by various scientists, the information on the various other aspects of organic acids which influence its efficacy is not so widely disseminated up to the end user, leading to the inaccurate use of organic acids, subsequently resulting into the inconsistency in the results as compared to the antibiotics.

Knowing that the pH in the GIT of the animal is different in different areas and that the pathogenic bacteria like E. coli and Salmonella spp. thrive and multiply in the lower GIT where the pH is favourable for their growth, the efficacy of the organic acids to control the bacteria depends on various factors such as the type and the form of organic acids used, the concentration and amount of acid reaching to the small intestine and the method of application. Though there are many organic acids available, each has a specific molecular structure and varied efficacy and a different MIC (Minimum Inhibitory Concentration) for different bacteria. Formic acid has the strongest antibacterial activity as compared to the other acids and has the lowest MIC compared to other acids (Table 1; Strauss and Hayler, 2001).

Table 1: Minimal inhibitory concentration (MIC) of formic acid (modified after Strauss and Hayler, 2001)

Bacteria	MIC (%)
Salmonella typhimurium	0.10
Escherichia coli	0.15
Listeria monocytogenes	0.10
Campylobacter jejune	0.10
Clostridium botulinum	0.15
Clostridium perfringens	0.10
Pseudomonas aeruginosa	0.10
Staphylococcus aureus	0.15

It has been seen that the liquid acids have very little or no role when the focus is the control of pathogenic bacteria in the lower gut, as more than 90-95% acid gets digested before reaching the small intestine. It has been seen in such a study, that only 5.5% of the formic acid reaches to the small intestine when used at a dosage of 0.5% liquid formic acid (85% active ingredient) in compound feed (Kirsch 2010).

Similar results were observed earlier by Maribo et al. (2000) when the authors only detected 4.4% of active ingredients in the small intestine by using a dosage of 0.7% liquid formic acid in the diet. Moreover, the liquid acids are corrosive so it is not practical to use these acids as such. All pure liquid organic acids are corrosive products. Even if these liquid acids are sprayed on a carrier, the product can remain corrosive.

Salts of organic acids, like calcium propionate, sodium formate or sodium benzoate generally referred to as single salts, as it has one molecule of mineral and one molecule of acid in its structure, seemed to be a good option to add active ingredients in a solid and non-corrosive form, it also helps in reducing the buffering capacity of the compound feed. Studies have shown that organic acid salts led to lower E. coli counts in the ileum and higher Lactobacillus counts in the colon of piglets (Bosi et al. 1999)

Although no much data is available on the amount of acid reaching to the small intestine when used in the form of single salts, quite encouraging data is available on the diformates- the double salt of formic acid (one molecule of mineral and two molecules of formic acid), which shows about 85% of the formic acid enters the small intestine when used in diformate form (Figure 1).

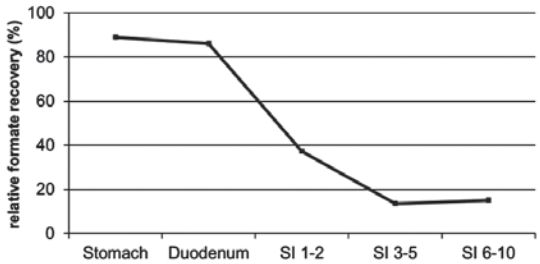

Figure 1: Recovery of diformate in the GIT (after Mroz et al., 2000)

As the amount of formic acid reaching the small intestine (SI) is quite high, one can see well documented results with diformates at much lesser dosage as compared to the single salts.

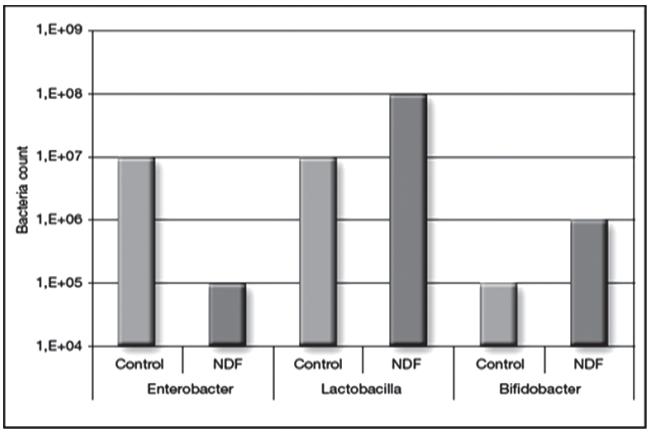

Figure 2: Effect of sodium diformate (traded as Acidomix DF +) on gut microflora in poultry (after Lückstädt and Theobald, 2009)

The availability of higher amounts of active ingredients in the gut will have an influence on the overall gut microflora. Such a study showed (Figure 2) that the number of pathogenic bacteria has been lowered by about 99% whereas the number of beneficial bacteria is improved by one log (Lückstädt and Theobald, 2009).

Tests against intestinal pathogens, including Salmonella, have shown that diformates have significant antimicrobial activity in broiler chickens (Table 2). Keeping bacterial pathogens under control reduced the probability of causing a disease outbreak.

Table 2: Salmonella profile (in % positive) in naturally contaminated broiler in Spain fed with or without sodium diformate (NDF) – after Lückstädt and Theobald, 2009

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

In further studies with 0.3% of sodium diformate, carried out at a university in Taiwan, the positive effects on pH in the upper GIT and the improvement in digestibility of protein & fat were seen (Table-3).

Table 3: pH-values and digestibility coefficients in broiler fed with or without sodium diformate (NDF) till 35 days (after Lückstädt and Mellor, 2013)

	Control	AcidomixDF + (0.3%)	Difference (%)
pH in crop	4.24	3.96	-0.28 units
pH in stomach	2.94	2.58	-0.36 units
Protein digestibility (%)	61.6	63.3	+2.7
Fat digestibility (%)	90.5	91.1	+0.7

A subsequent trial in the Ukraine, with the addition of 0.2% / 0.1% kg of sodium diformate showed an improvement of 6% in the average daily weight gain against a positive control consisting of an acid blend on carrier with the same dosages, while the FCR was improved by more than 5% (Table 4). Furthermore, this NDF-inclusion reduced the mortality by more than 21%. Finally, the productivity index (EBI) was increased by almost 13%, thus leading to a more cost-effective production.

Table 4: Sodium diformate vs. positive control in commercial broiler in the Ukraine (2013)

	Positive control	AcidomixDF+ (0.2/0.1%)	Difference (%)
Weight, day 20 (g)	931	970	+4.2
Final weight (kg)	2.550	2.700	+5.9
ADG (g)	60	63	+6.0
FCR	1.84	1.74	-5.4
Mortality	2.8	2.2	-21.4
EBI	315	356	+12.8

Though it has been well established that the diformates by the virtue of high formic acid content and with an ability to reach the small intestine in maximum concentration, exhibits excellent antibacterial and growth promoting results, the fact remains that the organic acids are more efficient in controlling the Gram-negative bacteria and show limited activity on the Gram-positive pathogenic bacteria.

In order to have a true antibiotic replacement agent, the combination of diformates with some other sustainable resources which show efficient antibacterial activity against Gram-positive bacteria would be of great advantage.

Work on such 3rd generation acidifier is currently carried out. The data available on the combination of diformates with the plant extracts (traded as Formi Alpha), containing different alkaloids (which show excellent activity against the Gram-positive pathogenic bacteria) are quite encouraging.

From a trial done in Germany in 2015 it was seen that the combination of diformates with the plant alkaloids can, next to the regular impact of diformates on performance and digestibility, considerably reduce Streptococci spp. incidences – and have therefore also a demonstratred impact against Gram-positive bacteria. Futhermore, data are available which show a positive impact on intestinal health, in such a form that the lesion score caused by Clostridia infection is significantly improved.

This and some more data that is available until now, assures that the antibiotics can be definitely replaced with safe and sustainable alternatives for prophylactic use. Such sustainable products will be helpful in improving the performance of the animals with no disadvantage to mankind and environment.

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PRESS RELEASE

Phytogenics – be one step ahead with plant derived feed additives

by Jan Dirk van der Klis and Ester Vinyeta, Delacon Biotechnik GmbH, Austria. www.delacon.com

When it comes to feed additives (plant extracts, enzymes, pro- and prebiotics, organic acids and many more), the livestock industry is inundated with numerous options, not only promoting performance of the animals and improving profitability, but also improving the quality of feed and of animal-derived products.

In this context, phytogenic (plant derived) feed additives are predicted to have a promising future in animal nutrition due to their broad range of efficacies, and to their effects on sustainability and safety.

Increasing upcoming resistance of bacteria, arising from continuously supplemented sub-therapeutic levels of antibiotic growth promoters in livestock feeding caused the European Union to ultimately impose a ban on the use of antibiotics in animal nutrition in 2006, with other countries worldwide following suit. At the start of 2017, a ban on antibiotic growth promoters will also become effective in the US. Consequently, alternative feed additives are receiving increased attention among scientists, nutritionists, feed manufacturers and farmers.

Proven for centuries

The use of plants and their compounds has a long history in human nutrition and medicine, being used as flavors, food preservatives and medicinal plants. Phytogenic feed additives (PFAs) comprise a wide range of plants, like herbs, spices and plant-derived essential oils (hydro-distilled extracts of volatile plant compounds, mainly hydrocarbons, containing most of the active substances of the plant) and oleoresins (extracts based on non- aqueous solvents). The chemical composition of PFAs underlies a certain variation due to their ingredients and other influencing factors like climate, location, harvest, stage, and storage conditions, explaining the differences in efficacy between PFAs that are available on the market so far. However, it should be realized that not all PFAs available on the market are standardized on major actives and/or based on all-natural plant ingredients but might also contain synthetic nature-identical components.

The 'scientific gold standard' in the feed industry

Phytogenics show a wider range of activities in animal nutrition than synthetic substances. This advantage is based on the synergistic effects of all agents within plants. This natural synergy, grouped with sustainability and safety, is what makes phytogenics a top solution platform in animal nutrition.

Fully based on phytogenic components and not on nature-identical, single active ingredients, to date, only one such plant-derived feed additive has received zootechnical registration by the European Union, Fresta® F. This is seen as the scientific 'gold standard' in the feed industry, because in the course of strict approval processes, not only the safety but also the performance enhancing effects as 'natural growth promoter' of the product have been officially confirmed by the European Food Safety Authority (EFSA).

PFAs show a wide range of potential benefits, all targeting the enhancement of performance of livestock. The following gives an overview of proven benefits:

Increased enzymatic activity in the intestinal tract

Numerous herbs and spices are shown to increase pancreatic enzyme production and bile secretion in the intestinal tract. For instance, curcumin, piperin, ginger and capsaicin clearly stimulate pancreatic enzyme production, whereas fenugreek, mustard, cumin and coriander stimulate bile production. Increased enzyme production improves the rate of digestion of the feed, thus improving its nutritional value.

Improved nutrient utilization

Apart from a better nutrient digestibility, data from broiler trials indicate an improved nutrient utilisation (similar body weight gain at reduced feed intake). However, these effects can vary due to type and origin of the essential oils or herbs and the inclusion level in the feed.

Antioxidant effects

Aromatic plants from the plant family Labiatae (rosemary, thyme, oregano and sage) have been extensively studied for their antioxidant activity. This activity is not only related to the phenolic compounds which have free-radicals scavenging properties but also non-phenolic compounds may show considerable antioxidant activity by enhancing gene expression of antioxidant enzymes.

These antioxidant effects are protecting the organism at cell and tissue level, especially during stressful conditions like weaning, reallocation, feed changes, poor ventilation and heat stress conditions. Moreover, positive effects of dietary supplementation with oregano, rosemary and sage on shelf life of poultry meat, as well as eggs, have been reported.

Antibacterial effects

According to some studies, extracts of herbs and spices exert clear antibacterial activity against foodborne pathogens. However, minimum dietary inclusion levels in poultry are generally too high to be able to rely on these antibacterial effects and to be economically feasible. Nevertheless, levels needed to inhibit the expression of virulence factors by pathogenic bacteria (quorum sensing inhibition) are far lower and have been shown to be a promising field of application.

Effects in intestinal mucosa

Several studies indicate positive effects on the intestinal morphology in poultry. Increased transepithelial electric resistance of duodenal mucosa was observed when broilers were fed thymol supplemented diets. Moreover, pungent substances like black pepper, chili and garlic improve blood flow, which might reduce the adverse impact of ischemia of the gastrointestinal tract on intestinal integrity.

The success of plants is no accident

Increased pressure in terms of food safety, raising concerns about bird health and environmental protection, rising feed costs, increasing antibiotic resistance, strong global tendencies to reduce antibiotic growth promoters – these factors explain why phytogenics are seen among the top solution platforms in animal nutrition for the near future. Due to their content of an infinite variety of active ingredients, phytogenic substances represent one of the most interesting and important classes of current and future feed additives.

References are available on request

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PRESS RELEASE

SWOT Analysis Of The Poultry Sector in India

Dr. Ramdas Kambale, Director - Sales APAC and Board Member, Vetphage pharmaceuticals.

The poultry sector in India faced considerable setbacks due to the pandemic. Millions of small farmers across the country are still reeling from the aftermath of the outbreak, which crashed the sales of poultry meat by 80 percent due to false claims that chickens can transmit the novel coronavirus to humans. Karnataka, Maharashtra, Andhra Pradesh and Orissa have especially been hit badly, with a number of farmers resorting to panic sales and some even taking the drastic measure of culling their chickens. While a full scale recovery is going to take time, we need to evaluate the strengths, weaknesses, opportunities and threats vis-à-vis the poultry industry.

Dr. Ramdas Kambale

Strengths

- The production infrastructure in Indian poultry farms is world class. From genetic selection in breeding and top of the line animal health products to pathogen free eggs, disease surveillance and monitoring, our production facilties are getting more efficient and organized.
- The productivity has also gone up, and the growth rate has been good. The compound annual growth rate is around 5 percent for eggs and 7 percent for poultry. The CAGR of Gross Value Added (GVA) for the last five years for egg and poultry is 13 percent and 15 percent respectively.
- Our genetic stock is self-sufficient and globally, we are the second biggest producer of eggs and the fifth biggest producer of poultry meat.
- The production cost is next only to Brazil and there is a huge potential to tap the growing demand worldwide.
- 75 percent of the non-vegetarian food that is consumed in the country comes from poultry products.
- Poultry has the highest return on capital and per unit land. It has the best biological efficiency of all animal meats.

Weakness

- Although there are 39 veterinary colleges, most of them have not kept pace with industry growth and the demand for an increase in efficiency across all the levels of the value chain.
- The high input and high output production system is the most dominant system, and this has shrunk the market space of traditional poultry rearers.
- The formal financial systems are not very supportive of investments, although we hope to see an improvement in the situation in the wake of the pandemic.
- The international market remains untapped. The EU and USA offer subsidies to their farmers. We also need to come up with more subsidies so that we can create a level playing field.
- Some states levy taxes even on live meat. This is coupled with a differential VAT structure for equipment and ingredients.
- There is a growing trend of urban consumers of convenience food. There is a taxation impact of an increase in 25-30 percent of the MRP.

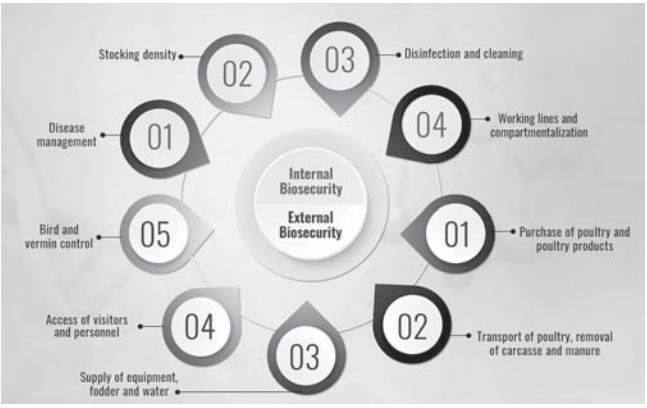
Opportunities

- Despite the small setback caused by unfounded rumours, consumer awareness and acceptability of chicken and eggs as healthy and nutritive foods is increasing.
- There has been an increase in the income generation and purchasing power of both the rural poor and marginal farmers. Thus, there is an increase in demand in the domestic market. This coupled with the fact that a lot of vegetarians are embracing meat presents an opportunity.
- Under WTO obligations, the import duties and import trade controls have been lifted and this has led to an increase in competition. Larger quantities of table eggs and imported chicken have started to arrive in the Indian market.
- The pesticide and antibiotic residues in our poultry products hover around 0.15 ppm whereas the globally accepted levels are 0.3 ppm. We need to reduce the use of antibiotics and switch over to bacterio-phages to bring down the antimicrobial resistance and develop more targeted antimicrobial treatments.
- The turnover in the poultry business is quick and the growth cycle is fast. Since it generates Fast cash, faqrmers can take interest in the business.

Threats

- Disease outbreaks pose a threat to the poultry industry. While the current panic is unfounded, regular poultry disease outbreaks are cause for concern.
- There are considerable restrictions on the import of feed ingredients like soya and corn.
- Since there are no institutional markets, there is a huge volatility in the price of poultry
- Housing costs continue to rise and that is a problem for small scale breeders. However, the costs are low in eastern and southern India.
- Poor export infrastructure is hindering the export of most poultry products.
- A lot of countries have taken measures to protect their poultry industry from foreign competition via protective measures such as restricting imports, keeping the egg process low and a lot more.
- We also face stiff competition from Pakistan, Sri Lanka, Brazil, and France. All these countries provide export incentives and subsidies to exporters, and keep their process low.

Poultry farmers across the country sought assistance from the government, stating that the current outbreak is even more widespread than the bird flu outbreak of 2006, which was mostly restricted to the Western parts of the country. A lot of farmers complained that it is difficult to maintain their livestock as they are unable to feed them. Farming bodies requested for subsidies from the local government to extend subsidies to poultry farmers so that they can pay their local taxes and electricity bills. The situation is a threat to the central government's National Action Plan to increase production in the egg and poultry industry. Unfortunately, the current crisis has compromised many of the action plans and is expected to



undermine the growth unless the government intervenes, and we hope they introduce policy measures after taking the aforementioned aspects into consideration.

Crown Chicken adopts on farm hatching across its whole business

East Anglia-based poultry integrator Crown Chicken has adopted on-farm hatching across its entire business, using a Belgian-Dutch system supplied by NestBorn.

The NestBorn system takes pre-incubated eggs, which are transferred from setter trays directly onto a natural litter bed in the poultry house. This completely removes the need for a hatchery, and according to NestBorn results in robust chicks, "born in natural and stress-free conditions" and which have direct access to feed, water and light.

"After the first contact with NestBorn in September 2018, our first trial with this concept already took place in November of that year," said Matthew Ward, Agricultural Director of Crown Chicken.

Daniel Bush, senior broiler production manager for Crown Chicken, said these tests confirmed prior positive experiences with on-farm hatching. "What is particularly attractive with the NestBorn system, is that we observe all the advantages and clear benefits of early feeding and on-farm hatching, but that no specific installations or investments are needed in the poultry house, making it very accessible."

"This results in excellent technical performance, less mortality and morbidity and a lower use of antibiotics," said Ward. "The results were very clear and convincing and have led to an update of the Red Tractor Poultry Standard, permitting on-farm hatching as from 1 October 2019 on broiler chicken farms".

The first NestBorn egg placing machine became operational at Crown Chicken in December 2019 and in January, a second machine was installed.

"The hatch of day-old chicks in our hatchery has completely ceased now," said Bush. "All 600.000 chicks a week that were coming from the hatchery in Kenninghall are now hatched on-farm".

"These machines are battery-driven and every machine has the capacity to place up to 200,000 eggs per day; furthermore they are easy to clean & disinfect," said Bush. "Our ambition is to obtain in the near future, that all the day-old chicks intended for our processing plant, are hatched on-farm."

Kees van Oers, chief executive of the NestBorn company, said: "An ambitious poultry integrator such as Crown Chicken with high focus on animal welfare and quality products is an ideal entry for us in the United Kingdom and together we will turn animal welfare into profit.".

Source: poultrynews.co.uk

Call for Seasonal Worker scheme to be extended to Christmas turkey staff

The Association of Independent Meat Suppliers (AIMS) is calling on the Government to extend the rules for seasonal agricultural workers coming to the UK from covering just fruit and vegetable pickers to include staff working in turkey processing sites in the run up to Christmas.

DEFRA published 'Coming to the UK for seasonal agricultural work' in the summer to provide information for workers coming to England to pick fruit and vegetables and their employers. However, as in previous years, many turkey farmers and processing businesses now need to bring in skilled labour from the EU for the seven weeks from November to mid-December.

"We have members who have employed the same people year on year. These skilled staff travel from countries such as Slovakia and Poland to live and work on the farms, processing Turkey for our country's annual Christmas celebrations," said Norman Bagley, Head of Policy at AIMS.

"In the case of the fruit and vegetable pickers they are allowed to include their 14-day self-isolation period within their work schedule providing that they live on the farm. Our members have told us that they too provide on farm accommodation and will also ensure that the staff have been tested for coronavirus before they arrive in the UK as well as having provision to test once they are here," he continued.

"We are asking for the Government to urgently update the rules for seasonal agricultural workers to include short-stay turkey processing workers. Time is running out, travel plans need to be made, turkey farmers need to know that the labour is available and farmers customers be they shops, caterers or the public through direct sales need to be confident that their annual Christmas turkey will be available."

Source: poultrynews.co.uk

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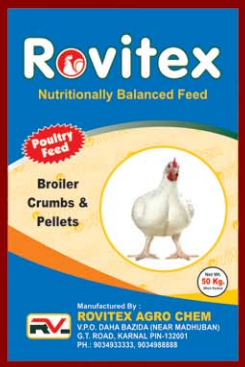

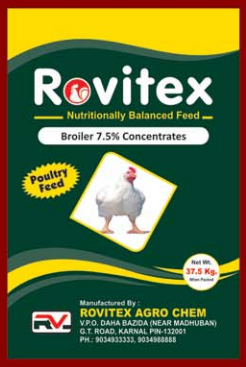

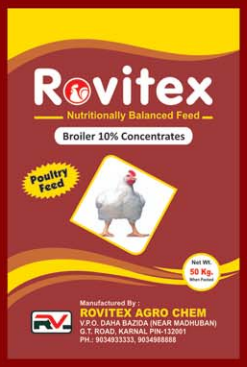

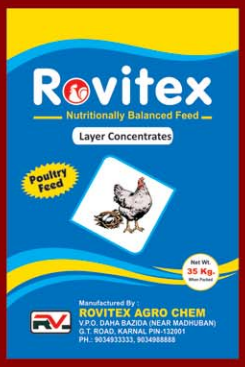

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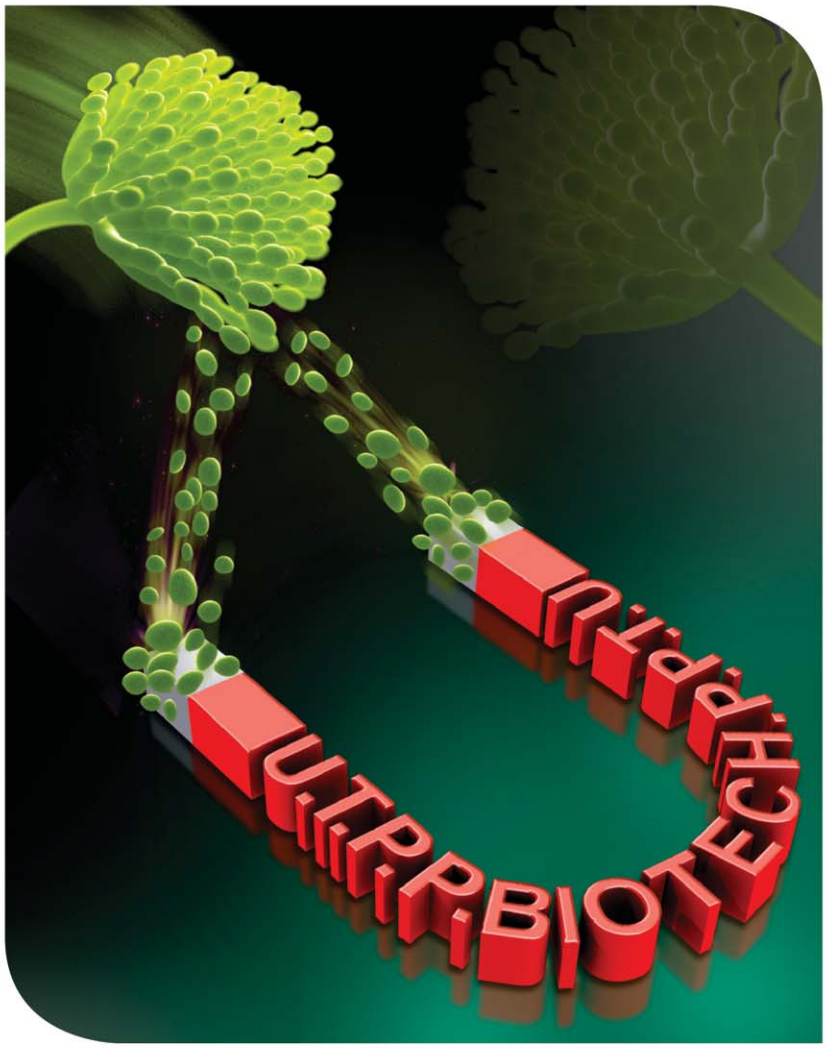

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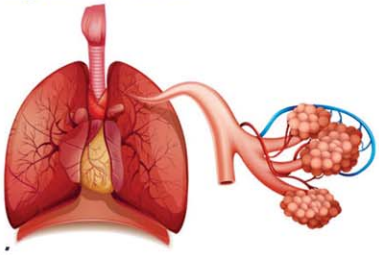
- **For better FCR**



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Biomin®

A Natural Solution to Coccidiosis Control

Use of anticoccidial drugs and vaccines has long been effective in protecting in broilers, broiler-breeders and non-caged layers against Eimeria infection. But with antibiotic resistance and vaccinal reaction on the rise, many are turning to natural solutions to control coccidiosis in poultry.

By Seung **Hwan Jeong** DVM MSc, Regional Poultry Technical Manager, BIOMIN Singapore

In Brief

Vaccine- and antibiotic-based methods of controlling coccidiosis have several disadvantages.

Consumers and governments are increasingly demanding a reduction in antibiotic use in poultry.

Three natural products - phytogenic feed additives, probiotics and synbiotics - can control coccidiosis without the use of antibiotics.

Traditional Approaches to Coccidiosis Control

The traditional approach to controlling **coccidiosis**, using either anticoccidial drugs in broilers or vaccinating broiler-breeders and non-caged layers, has shown good protective efficacy against Eimeria infection for several decades. However, these traditional approaches have disadvantages including resistance acquisition from long-term use of single-class anticoccidial drugs and vaccinal reaction from poor vaccination practice. Moreover, rising consumer demand for **antibiotic-free chicken** makes traditional programs less effective as many governments classify ionophores and anti-coccidial drugs as antibiotics.

Alternative Solutions to Controlling Coccidiosis

Given the limitations of traditional coccidiosis control programs, alternative solutions to replace

or reinforce traditional programs are being sought. As Eimeria species multiply in the bird's intestinal tract, causing tissue damage at specific lifecycle stages, any compounds which inhibit the lifecycle of Eimeria show protective efficacy against coccidiosis. Coccidiosis vaccination can confer immunity to minimize the population of Eimeria in the intestinal tract, and chemical anticoccidial drugs can inhibit a certain stage of the lifecycle in the infected enterocyte. In addition to the traditional approaches, scientific research has found that some phytochemicals can also interrupt the lifecycle of Eimeria species (Thangarasu et al., 2016).

One of the key properties of a **phytogenic feed additive** (PFA) is its inhibitory effect on a certain lifecycle stage of Eimeria species. Some essential oils also minimize the replication of Eimeria species by the upregulation of epithelial turnover. Induction of epithelial cell death has been characterized as a defensive mechanism used by the host to limit infection by enteric pathogens. Cell death allows the elimination of damaged cells and limits persistent pathogen colonization. The upregulation of epithelial turnover by supplementation with a PFA furthermore facilitates the repair of epithelial injuries and decreases the intestinal permeability induced by pathogens including Eimeria species.

Another alternative solution to coccidiosis is the use of **probiotics** which introduces healthy microbiota into the gastrointestinal tract. Probiotic supplementation has been shown to improve protective efficacy against several pathogenic bacteria and parasites. Although the role of probiotics and prebiotics for the prevention of Eimeria species is not clearly determined, the immune modulation effect of a healthy microbiota, competitive exclusion to Eimeria invasion and the production of short chain fatty acids with global upregulation of enterocyte turnover all contribute to the prevention of coccidiosis.

Using Synbiotics to Reduce Coccidiosis Challenges

A 42-day trial was designed to evaluate the efficacy of a synbiotic product (PoultryStar®) to prevent the clinical signs of coccidiosis and minimize economic losses in a challenge model compared to treatment with Salinomycin. In this trial, four groups were assigned (Table 1).

Trial group	Additives	Challenge
Negative control	-	No challenge
Positive control	-	Challenge
Salinomycin	66 mg Salinomycin / kg of feed	Challenge
Synbiotic	1 kg of Synbiotic / kg of feed	Challenge

On day 15, all birds except those in the negative control group were challenged with approximately 75,000, 25,000, and 75,000 counts of Eimeria acervulina, E. maxima, and E. tenella oocystes, respectively. Performance parameters including feed intake, live body weight and feed conversion ratio (FCR) were measured. On days 21 and 42, three birds from each pen were selected, euthanized and examined for the presence and degree of coccidiosis lesions. The upper, middle and cecal regions of the intestinal tract were scored, using the Johnson and Reid (1970) system, where 0 is normal and 1, 2, 3, or 4 indicate increasing severity of infection. On days 21, 28, 35 and 42, 10 fresh fecal samples were collected per pen for oocyst counting.

Performance parameters in the synbiotic group were significantly improved compared to the

positive and negative control groups, but were similar to the Salinomycin group (Table 2). Cumulative oocyst shedding in the synbiotic group did not differ from the Salinomycin group (Figure 1). Intestinal lesion scores at day 21 were similar in the synbiotic and Salinomycin groups (Figure 2).

Table 2. Feed intake (kg/bird), final body weight (kg/bird) and feed conversion ratio (FCR) values on day 42

Performance parameter	Negative control	Positive control	Salinomycin	Synbiotic
Feed intake	4.07 ± 0.08	3.91 ± 0.08	3.93 ± 0.12	3.65 ± 0.05
Final body weight	2.31 ± 0.08	1.91 ± 0.03	2.19 ± 0.03	2.01 ± 0.01
FCR	1.76 ± 0.03	2.04 ± 0.01	1.79 ± 0.02	1.81 ± 0.02

Figure 1. Oocyst count per gram of fecal material

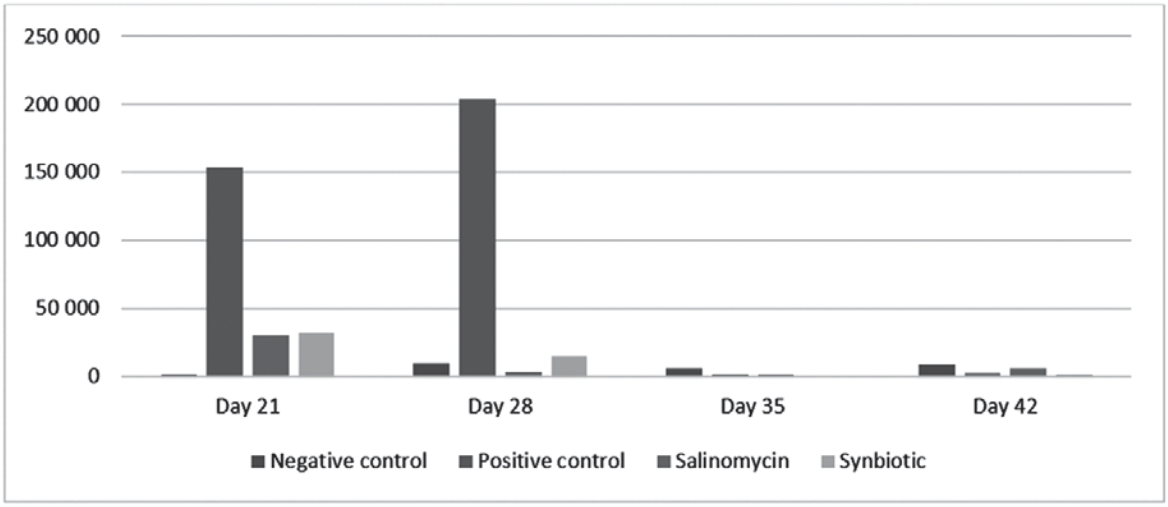
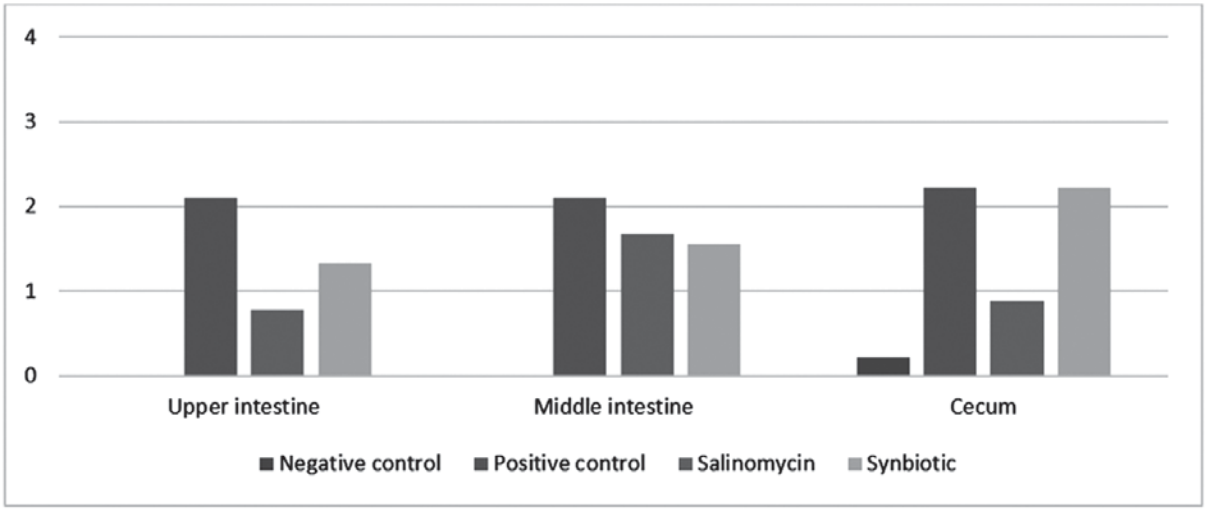


Figure 2. Lesion scores



Feeding a synbiotic or Salinomycin to birds gave similar effects, where birds in both groups shed less oocysts and had fewer intestinal lesions, indicative of a healthier intestine. Broilers that received the multi-species, host-specific synbiotic (**PoultryStar**®) in their diet performed at a similar level to broilers that received Salinomycin in terms of overall FCR, oocyst shedding, and intestinal lesions.

PRESS RELEASE

Entrepreneurs Day On 22nd October as a part of EPAW Organised by CPDO & TI From 19th To 23rd October, 2020

Central Poultry Development Organisation & Training Instittute under Government of India, Ministry of Fisheries, Animal Husbandry & Dairying, a premier Institute located at Hessarghatta, Bengaluru organized a 5-day online **Entrepreneurship in Poultry – Awareness Week (EPAW)** from **19th – 23rd October, 2020**.

The programme was planned to impart the knowledge for entrepreneurs focused on Business models in Indian Poultry, Commercial Poultry Farming & Rural Poultry Farming, Credit proposals for Bank, Government of India Schemes, and understanding of profitable poultry models, Nutrition, Disease Management and Medications etc.

EPAW was planned to create awareness among prospective entrepreneurs, Bankers, graduates and veterinarians across India. The schedule was very comprehensive covering all the aspects above mentioned. **Prof. Gopal Naik, IIMB** inaugurated the programme on 19th October, 2020 and narrated ample opportunities in the value chain of poultry sector. **Dr. Mahesh P.S.**, Joint Commissioner, GoI & Director presented an overview of poultry sector and **Dr. Krishnan** illustrated the basics and nuances of poultry farming on the first day.

Prof. Prathap Kumar and **Prof. B.S.V. Reddy** former Deans of Veterinary College briefed the audience about management aspects and salient features of Poultry Nutrition. **Dr. Baburaj**, DGM, Venkys India elaborated on common poultry diseases, medications and vaccinations followed by **Dr. Lipi Sairiwal**, Assistant Commissioner GoI briefed on Government of India Schemes in poultry.

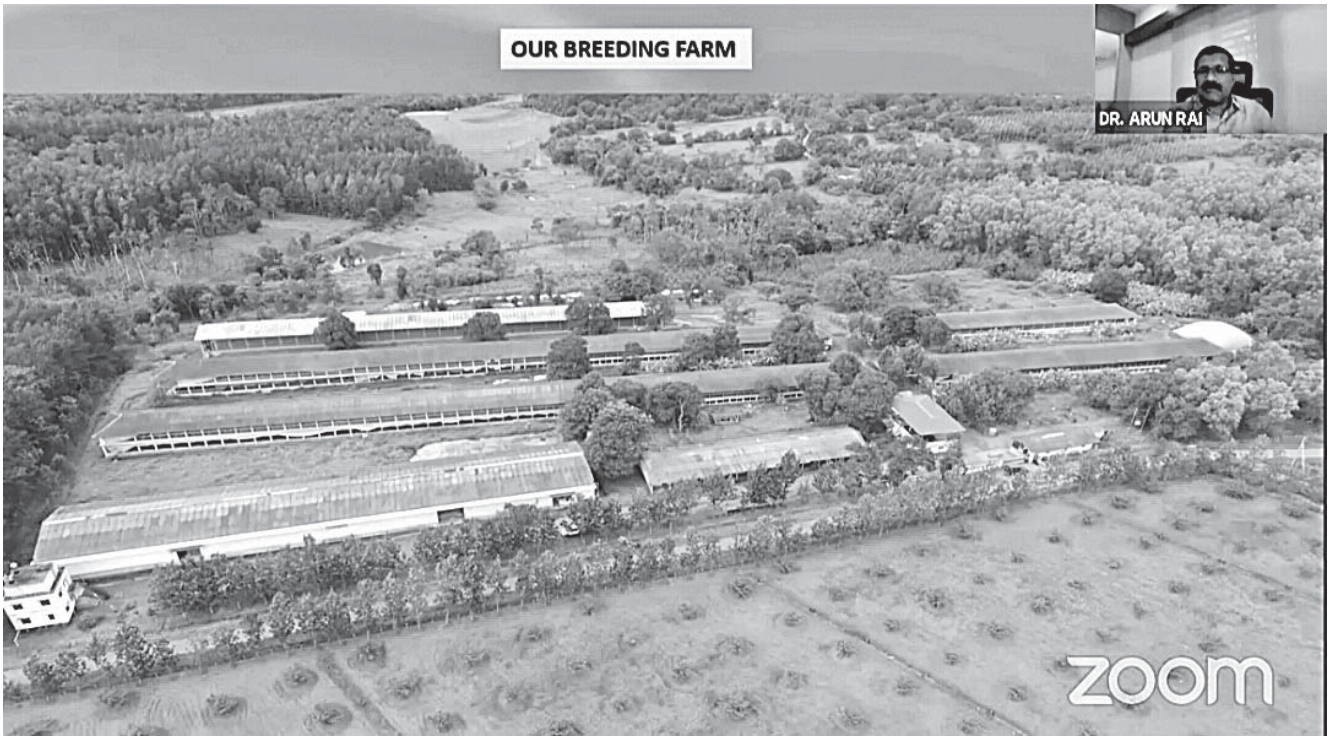
On 22nd October, 2020 Entrepreneurs day was conceptualized for getting the first hand information from the hard working successful entrepreneurs in poultry sector. Concluding day on 23rdOctober, 2020 **Dr. Jeevan Sonawane**, Director, Novelvet presented on Incredible Eggs and Chicken – Facts and Myths. Dr. Mahesh presented on availing credit facilities in Nationalized Banks and various business models of poultry in detail as a final session.

All these recordings are date wise posted on our Facebook page with the link https://www.facebook.com/cpdoti.bangalore . All are requested to browse any time at your convenience.

ENTREPRENEURS DAY:

Dr. Mahesh invited following successful entrepreneurs for a one-to-one presentation for the audience on 22nd October, 2020. Dr. Atul Latkar, Managing Director, Kasturi Farms, Nasik, Dr. Arun Rai, Managing Director, Bharat Agro, Mangalore, Mr. Varun, CEO, Sneha Group Hyderabad, Dr. P. Nallappa, Managing Director, Jagadish Farms, Bangalore, Mr. Manikam, Managing Director, Megha Farms Mysore and MR. Manjunath, CEO, Happy Hen Farms, Bangalore were the panelists.

Dr. Atul Latkar, experienced veterinarian having decades of experience in private sector started a journey as entrepreneur under the brand name Kasturi Farms in Nasik. In his presentation he elaborated various business opportunities in Layer Farming more specifically in pullet rearing business.



He demonstrated that crisis like Corona can be turned into opportunity for expanding the layer pullet business into complete layer business for his group. He claims presently as a leading pullet (18 wks ready to lay layer birds) supplier across India.

Dr. Arun Rai, Veterinarian who also started his career in private sector joined hands with like minded partners to start their own venture Bharat Agro at Mangalore. Their entrepreneurship began in a small way with broiler farms, custom hatching. Later they have expanded into breeding farms, processing plant, commercial shops, rendering plant, biogas facility, rainwater harvesting, large hatchery, premix plant and a huge feed mill for the group. Dr. Arun Rai briefed in detail keys for success for the entrepreneur namely, Honesty, Sincerity, Hard work etc to name a few. **(detailed video / audio presentations of all the speakers can be viewed at our face book page posted on 22nd October, 2020**).

Mr. Varun introduced his group as 3500 crore turnover company with a team of 5,000 employees managing 100 plus own chicken retail outlets along with over and above 2500 franchisee outlets in south India. Sneha group, a big conglomerate having all the operations of Breeding Farms, state of art feed mills, commercial broiler farms, largest processing plant in India (12,000 birds per hour), handling daily 3.5 lakh birds in Hyderabad. During the chat with Dr. Mahesh, Varun answered many queries about their group efficiency, advice for small retailer, future of broiler industry in India etc. Mr. Varun said that, "It's no more a secret for anybody's fitness but to opt for chicken and egg in their daily diet to meet body protein requirement of the human being. Personally he endorsed that he consumes lot of eggs, 3 – 5 kilos of chicken per week along with five days of rigorous workout as a commitment being a CEO for such a large group Sneha. He is very active in social media with Sneha Select as a group app of choice as a one stop solution for protein needs.

Dr. Nallappaa staunch believer of hard work and always be seen in poultry farm elaborated about his journey from broiler farmer to large breeder entrepreneur. In his presentation he categorically presented stepwise instructions for construction of broiler breeder project under cage system for 30,000 female breeders. His presentation includes a pictorial look back from Pooja to housing of

breeders at his unit.(Detailed video / audio presentations of all the speakers can be viewed at our face book page posted on 22nd October, 2020). In his concluding slide he gave a cost estimate for each of the activities in construction on a per bird basis. For cage about Rs. 350/- per bird (30%), Building material Rs.195 (16%), Building Steel Rs. 117/- (10%), Truss Purlin fabrication Rs. 105/- (9%) to name a few. An overall estimate of Rs. 1,250 to 1,300 is the project cost for only construction of such project.

Mr. Manikam and **Mr. Vasanth**, son of Manickam heading Megha Group briefed the audience about opportunities in modern layer farming and how to brand eggs to reach super market across India. Megha farms is a trend setter in adaptation of technology in layer farming namely automation, packaging, branding designer eggs etc in Karnataka. Megha farms has now forayed into broiler breeding and commercial broiler integration along with layer activities. Both expressed the need of support from the government for technology adaption and innovation for the entrepreneurs which is lacking at present.

Mr. Manjunath explained in detail their startup which was conceptualized in two minutes has come a long way to present branded free range eggs in the market priced at Rs. 25 to 30 per egg. His group is operating more in Tamilnadu started with 100 eggs production per day to a level of 10,000 eggs per day presently. Mr. Manjunath acknowledged the contribution of CPDO&TI in hand-holding their group and supplying Kaveri as a rural egg layer bird for the venture. Manjunath requested support of government for free range certification in India, presently he is getting certificate from Europe or USA.

Dr. Mahesh concluded the programme by interaction with the panelists and answering many queries by the audience. All in all every day an average of **1,500 viewers** were recorded both in Zoom and facebook page of CPDO&TI. The event was well appreciated. The team CPDO&TI guaranteed to conduct such many more programmes in the coming future.

Sri. Anwar Basha, Senior faculty of CPDO&TI executed the job of admin of conducting EPAW very effectively. The other team members of CPDO&TI worked hard in making this programme successful. The entire programme was live broadcasted on CPDO&TI facebook:www.facebook.com/cpdoti.bangalore. All the recordings of 5 days are uploaded on the same day as a ready reference for the facebook visitors.

PRESS RELEASE

Emulsifier Academy - ORFFA launches a global initiative to support awareness on applications of nutritional emulsifiers in animal feed

As part of its scientific and technical mission to promote the usage of nutritional emulsifiers (a known supplement in animal nutrition), Orffa launches a global initiative called the Emulsifier Academy. The Emulsifier Academy is a platform which has the objective to increase the knowledge on new applications and create more awareness regarding all the ins and outs of nutritional emulsifiers and to increase the consumption of nutritional emulsifiers worldwide in animal nutrition.

Currently the main consumption of nutritional emulsifiers is found in the broiler industry, but even there the additive is still underutilized. Its potential to formulate cheaper diets whilst maintaining performance is still undervalued. Not only improved fat digestion is seen, but also upgrades on dry matter, protein and energy digestibilities have been reported. Next to that its ability to support digestion in antibiotic-free diets is hardly known. In other animal species, nutritional emulsifiers appear to be particularly promising for layers, turkeys, swine and fish.

The potential for nutritional emulsifiers in animal nutrition is very big, but decent scientific and technical promotion of the opportunities are required. As a leading player with a strong technical focus, Orffa aims to take the lead in global promotion in an effort to offer solutions to the global animal nutrition industry. Investments in long-term research programs aim to fill in the knowledge gaps. Orffa is simultaneously increasing its global network of scientific partnerships.

Orffa kicked of the development of emulsifier dossier with a pHd research project at the University of Lavras (Brazil). The dossier has been expended with controlled studies in large variety of universities and contract research institutes on all continents. Today a summary of these experiences is bundled in a comprehensive booklet "Emulsifier Academy: Excential Energy Plus - a 3rd generation emulsifier!".

This is the 3rd booklet within Orffa Academy line, following similar initiatives to share knowledge about organic selenium and betaine application in animal nutrition.

Heidi Heyvaert
International Marketing Manager
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heyvaert@orffa.com

PRESS RELEASE

Manuka Biotech Enters Malaysia and is Looking for Worldwide Distributor Partners

KULAI, MALAYSIA – The team at Manuka Biotech welcomed its first container in their regional office warehouse located in Kulai, Johor, Malaysia on 12 October. Manuka Biotech is a subsidiary brand under Singao Co., Ltd., one of the largest butyrate salt manufacturers in the world. Singao is also the first in China to launch water-soluble micro-encapsulated fat powder and its MCT series for animal feed application.

The reduction and elimination of AGPs in animal diets has led to increased intestinal health challenges and a higher incidence of diseases such as salmonellosis, leading to significant economic losses for producers. Taking advantage of the well-established technology from Singao, Manuka Biotech is delighted to introduce a range of functional and innovative fatty acid additives to Malaysia and the world, an effective way to enhance performance with or without the inclusion of antibiotics.

Manuka Biotech's range of products are based on in-depth knowledge of fatty acid functional properties in animal nutrition:

A. BTR™ Series: Butyrate-derived solutions –

- **BTR™ 98**: A pure sodium butyrate that optimises epithelium integrity
- **BTR™ Benz**: Organic acid coated butyrate resulting in greater digestive and growth efficiency
- **BTR™ Tannin**: Synergistic antibacterial effects. Reduces wet dropping and diarrhoea
- **BTR™ MCT**: A complex of MCT & tributyrin effectively against broad range pathogens
- **BTR™ E50**: A 50% purity tributyrin additive

B. Lipotech™ Series: Microencapsulated functional supplements –

- **Lipotech™ &!3**: Omega 3 enriched foods and lactation aid
- **Lipotech™ &!3 Plus**: A nutritional tool to protect liver function and reduce abdominal fat
- **Lipotech™ BA**: A natural endogenous emulsifier complex facilitating dietary fat & oil utilization
- **Lipotech™ MCT**: A comprehensive metabolic regulator securing animal performance

In times of the Covid-19 pandemic, Dr. Lai ZhouWen, the Chairman and founder of the Singao Group, chose to embrace cautious optimism, instead of stepping back from expansion. "We see the pandemic as a potential prospect to provide an alternative to the world of feed ingredient supply chain who have experienced disruption. Aligning with the concept of 'One Health', safeguarding animal health has never been more important. By protecting animal's health, we can protect the public's health against zoonotic diseases, and secure the profitability of farmers while providing consumers healthier and safer animal protein choices," explained by Dr. Lai.

"Our group is moving aggressively with a 50% growth in sales compared to last year. In this year alone, two more new production plants were successfully set up and are running in China in addition to the existing plant in Longyan, Fujian province. Manuka Biotech, a regional office located in Kulai, Southern of Malaysia, is a part of the group global expansion strategy." Dr. Lai aims to have the production facility in Malaysia installed and commissioning as soon as the world pandemic gets better.

Manuka Biotech is opening its doors to worldwide distributors who interested in building a partnership with us and making our products accessible to the domestic market. To inquire about our products or distributor partnerships, please email us at enquiry@manukabiotech.com

The Manuka Biotech team in Malaysia welcomed the arrival of first shipment

Dr Lai Zhouwen, the Chairman and founder of the Singao Group

Note to the Editor:

About Manuka Biotech

Manuka Biotech is a newly established business unit of Singao Co. Ltd., as a part of the group global expansion strategy with the regional office located in Malaysia. Singao has more than 20 years of experience in manufacturing butyrate salt and its application in the animal health and nutrition industry.

Being a world leader in researching fatty acid health solutions, Singao and Manuka Biotech possesses high-tech know-how technologies in emulsification and encapsulation to protect and preserve bioavailability of fatty acids to meet the often unmet or overlooked needs of productive animals. In the field of fatty acid nutricine supplementation, Manuka Biotech wants to become the first line of reference. The company is here to support and improve the animal producer profitability by choosing the right oils and by incorporating butyrate-based growth enhancers.

For further information, visit www.manukabiotech.com

Best Regards,

Rachel Liem
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Manuka Biotech Sdn Bhd (1335253-M)
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Bandar Indahpura, 81000 Kulai, Johor, Malaysia.
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www.manukabiotech.com

BROILER LIFTING RATES FOR THE MONTH OF SEPTEMBER 2020

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	98	103	113	118	123	123	123	123	123	113	108	103	103	103	105	107	110	112	112	112	112	112	107	107	102	103	108	108	110	110
Karimnagar	98	103	113	118	123	123	123	123	123	113	108	103	103	103	105	107	110	112	112	112	112	112	107	107	102	103	108	108	110	110
Warangal	98	103	113	118	123	123	123	123	123	113	108	103	103	103	105	107	110	112	112	112	112	112	107	107	102	103	108	108	110	110
Mahaboobnagar	98	103	113	118	123	123	123	123	123	113	108	103	103	103	105	107	110	112	112	112	112	112	107	107	102	103	108	108	110	110
Kurnool	98	103	113	118	123	123	123	123	123	113	108	103	103	103	105	107	110	112	112	112	112	112	107	107	102	103	108	108	110	110
Vizag	95	100	110	115	120	120	120	120	120	120	115	113	113	113	113	113	115	115	115	115	115	115	115	115	110	110	113	113	115	115
Godavari	102	107	117	122	127	127	127	127	127	127	120	113	113	113	113	113	115	115	115	115	115	115	115	115	110	110	113	113	115	115
Vijayawada	103	108	118	123	128	128	128	128	125	120	113	108	108	108	110	112	115	115	115	115	115	115	115	110	105	105	113	113	115	115
Guntur	103	108	118	123	128	128	128	128	125	120	113	108	108	108	110	112	115	115	115	115	115	115	115	110	105	105	113	113	115	115
Ongole	103	108	118	123	128	128	128	128	125	120	113	108	108	108	110	112	115	115	115	115	115	115	115	110	105	105	113	113	115	115


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Poultry Hatchery Business in India

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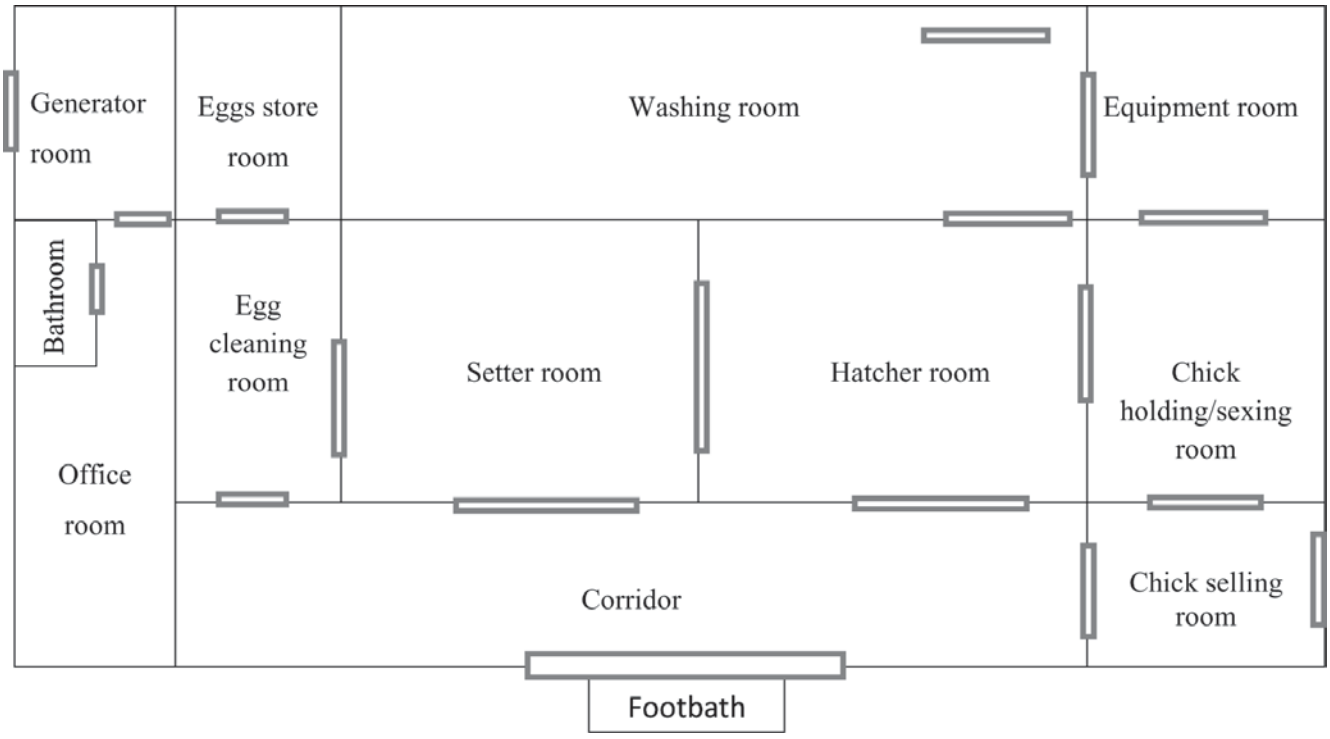
Suraj Amrutkar

Introduction: A hatchery is such a facility where eggs are hatched under artificial conditions, especially those of poultry eggs. Poultry hatchery produce a majority of bird's chicks by hatching their eggs including chicken, turkey, ducks, quails, goose and some minor bird species. A broiler breeder produces about 150-180 fertile eggs in a year of reproductive life. This reproductive capacity can't be utilized without liberating the breeding hen from incubating eggs. In India, there is huge demand of day old chicks for commercial poultry farming and for that there is great scope for hatchery business. The competition in the hatchery industry is increasing day by day for efficient production of quality chicks economically. Therefore, it may be necessary for the hatchery man have thorough understanding of the basic and practical aspects of incubation and hatchery operation for efficient working.

Location of Hatchery Building:

- Hatchery should be preferably located within 50 km from the marketing place on the outskirts of the city, town or village; avoiding congested residential areas.
- The hatchery location must be at least 1 km away from the nearest poultry farm.
- The site selected shall be a virgin soil; where poultry was not grown earlier.
- It must be an easy access to a high way by having a motorable road round the year for easy transportation of farm inputs and outputs.
- A three phase electricity supply should be available to the farm.

Hatchery Lay-out:



- Adequate drinking water of acceptable quality shall be made available in the premises.
- The areas should not be low lying, flood prone and water logging.
- Moreover, there should be quick drainage of rain and storm water from the premises.
- It is advisable to buy more land, if finance permits, for future expansion program.

Selection of Hatching Eggs: Medium size eggs are preferred over too small or too large eggs as they create hindrance in setting in incubation trays and also do not hatch as good. The optimum size of hatching chicken egg is about 55-58 g. Duck eggs may vary between 65-70 g and turkey eggs should be between 80-85 g. The shape of hatching eggs should be oval. Eggs with sound shell should be selected. The cracked eggs are easily detected at the time of candling and should be discarded. Hatching eggs should have good albumen and yolk quality and be free from blood and meat spots or any other defects.

Care of Hatching Eggs before Incubation: Collect the hatching eggs as frequently as possible, particularly in adverse weather. Clean eggs hatch better than the soiled eggs. Dry cleaning of soiled eggs with rough cloth or sand paper may be done before setting but involves considerable risk if soiled eggs explode in incubator. Hatching eggs should be set in incubator immediately after they are laid in order to reduce storage problems and optimizing hatchability.

Storage of Eggs: Duration of storage, temperature, humidity and other factors affect hatchability of eggs. It is common practice in the hatchery to avoid the pre-setting storage period beyond the 7th day. For longer storage period up to 7 days, temperature of 16-17°C should be used. For prolonged storage period, in excess of 7th days, even lower temperature in the range of 10-12°C is suggested. After the egg is laid, it cools down to its environmental temperature and it cools embryonic development slows down and eventually stops when the temperature reaches to below the physiological zero. The eggs remains under the physiological zero temperature (20-21°C). A pre-warming temperature of 23°C for 18 hrs. before setting eggs is suggested. High relative humidity and low temperature produces optimum hatchability by avoiding evaporation of water. 90% relative humidity has given better result.

Methods of Incubation: Natural method and artificial method are two types of incubation. Eggs are incubated with the help of broody hens under natural method. Eggs are incubated in "egg incubator" under artificial method.

Artificial method of incubation:

The physical conditions like desired level of temperature, humidity, ventilation and frequent turning of eggs are essential for proper incubation of eggs irrespective of method of incubation.

Temperature: In cabinet type incubator, setter temperature was varies from 37.2°C to 37.7°C and hatcher temperature varies from 35.5°C to 36.5°C depending upon their construction. The high temperature during early stage of incubation was not followed by immediate mortality of embryos but death was delayed until near hatching time. The other effects of high incubation temperature are smaller chicks, lack of alertness in chicks, crooked toes, spraddled legs, crooked necks *etc.* High incubation temperature has also shortens the incubation time by several hours. Exposure of eggs to 46°C for 3 hours or 49°C for one hour killed all embryos.

Humidity: In cabinet type incubator, relative humidity has 60% from first day to 18 days of incubation in setter and 70 % in hatcher from 19 to 21st day of incubation. During incubation, the hatching eggs must loose certain proportion of weight through moisture loss in order to produce strong viable chicks. In case of chicken eggs, the weight loss is about 10.5% through 19 days of incubation. Low relative humidity during incubation results in excessive water loss from the eggs; the effect will be small and hard chicks. If the humidity is too low in hatchers; there will be a high incidence of pipped eggs, and embryos are dried out in the shell or dead in the shell. High humidity during incubation prevents sufficient evaporation of moisture from the eggs resulting in large, soggy

chicks. High humidity also has a tendency to delay hatch and reduce hatchability. The chicks will have poorly healed navel. Shell will be sticking to chicks.

Ventilation: Oxygen requirement of hatching eggs is 21%. The concentration of CO_2 in incubator should be range between 0.3 to 0.5% for maximum hatchability. The concentration above 1% CO_2 increases embryonic mortality and at 5% concentration of CO_2 for prolonged period all the embryos die.

Position of egg: During Incubation in setter; broad end should be up. This position keeps the air cell in normal position and will reduce mal-position embryos. This position helps the embryos to develop with head towards the large end of eggs near the air cell. The chicks ready to hatch are able to break in air cell to initiate pulmonary respiration. Reverse setting of eggs reduces the hatchability by 10% and quality of chicks is also reduced. In hatcher, egg position should be horizontal.

Turning of eggs: Egg should be turn 3 hour interval (8 times a day) up to 18 days of incubation by tilting the egg tray at 45° in both the directions from the perpendicular or a total of 90°, gives the best result with frequent turnings. There is no need of turning of eggs during last three days of incubation (19-21days).

Candling of eggs: Candling of eggs should be done on 5th to 7th day of incubation to remove infertile and early dead germ eggs. But in certain hatcheries, eggs are tested twice, once on 5-7th day and second on 18th day on the time transfer of eggs from setter to hatcher. Candling of eggs should be performed in dark room.

Transfer of egg: Eggs should be transfer to hatcher when about 1% eggs are slightly pipped on 18th day of incubation.

Removal of Hatch: There exists a difference of about 36 hours between the time of the first and last chicks hatch. From practical standpoint, chicks should be delivered to the farm about 12 hours after the entire group is removed from the hatcher. Excessive drying of chicks in the hatchery should be avoided as it may cause dehydration to chicks. Chicks should be removed from the machine as soon as all are hatched. When the chicks are removed from the hatcher; the temperature of the chicks holding room should be 23.9°C to reduce the danger of chilling and have a relative humidity of 75% to reduce dehydration. After counting the number of chicks, they will be placed comfortably in chick boxes for transportation.

Important operation:

- Regular supply of electricity should be checked.
- Maintain the date of setting of eggs to perform other operation timely.
- Maintain cleanliness in the hatchery.
- Incubator should be checked by running it before one or two days of actual use.
- Thermometer should be checked very carefully because slight inaccuracy in thermometer will affect adversely.
- Check the optimum physical condition like temperature, humidity, ventilation and turning of eggs periodically.

Embryonic mortality: There are four stages during the embryonic growth when the mortality is more than the average. It is important to know precisely at what stage embryo has died in order to determine the cause of death.

Stage I: Before the egg is laid: Gastrulation is first critical period of embryonic growth. The growth is either advanced or too primitive depending upon the duration of formative egg is retained in the oviduct. Any abnormal retention will affect vitality of embryo and its ultimate survival.

Stage II: During 2nd, 3rd, and 4th day of incubation: Early embryonic death may be caused by many factors like faulty fumigation, poor pre-incubation, storage condition, improper incubation condition, genetic factors *etc.* Sometimes, it is also confused with infertile eggs. About 2% mortality occurs in normal hatch.

Stage III: During 7th to 18th day of incubation: Average daily mortality should be very low as total embryonic mortality during the entire period is less than 1% in normal hatch. Nutritional deficiency may be the main cause of embryonic death at this stage;

particularly of vitamin A. More embryonic mortality shows up during this stage resulting from genetic, nutritional and management problems.

Stage IV: During 19th, 20th and 21st day of incubation: This is the most critical period in embryonic growth. About 3% embryonic mortality takes place during this stage because adjustment pertaining to pulmonary respiration is required.

Factors affecting production of chicks:

Fertility and hatchability of chicks are two factors which affect the production of chicks in hatcher.

Fertility: Fertility is the result of laying house management rather than hatchery management. Good viable breeding males and healthy normal breeding female are requisite.

- **Wrong proportion of male to female ratio:** For most of heavy breeds, 6-7 males per 100 hens are enough for high fertility. For light breeds 5-6 males per 100 hens are adequate.
- **Rate of lay:** The flocks laying at a high rate usually have a high rate of fertility and hatchability. Eggs laid in longer clutch having high fertility.
- **Age of males:** The breeding males should be at least six or seven months old for resulting in high fertility. Too old Males cause poor fertility.
- **Laying pattern:** Fertility and hatchability are higher in the first year of laying than subsequent year. This is higher in the first 12-15 weeks of laying period then start decline. The first few eggs laid by pullet do not hatch well.
- **Weather condition**: Fertility decline considerably during severe hot and cold conditions.
- **Inheritance:** Fertility is poorly heritable traits.
- **Nutrition:** Male undernourished due to poor quality feed causes lower fertility.
- Interference among the male during mating
- Damaged combs and wattles among the males
- Sterile male causes poor fertility
- Eggs kept too long or under the wrong conditions before mating

Hatchability:

Hatchability depends upon internal quality of eggs, incubation conditions, age of breeder, rate of egg production and system of breeding *etc.* Maximum hatchability has been observed in eggs produced in the year of laying and during peak egg production. Inbreeding tends to decrease the hatchability whereas it is increased in crossbreds. Bacterial contamination of eggs also affects the hatchability of eggs. Deficiency of vitamins and mineral causes marked reduction in hatchability. The factors which affect fertility of egg; also it will affect the hatchability of egg.

Sexing of chicks: Vent method and auto sexing are two methods of chicks sexing.

- **Vent method:** This is very popular and originally developed in Japan. It depends upon the observation of rudimentary sexual organ. It depends upon the observation of rudimentary sexual organ.
- **Auto-sexing:** Plumage colour or growth of an organ or any other character linked with sex chromosome is taken into account to determine the sex. If such character is identified, sexing becomes very easy and accurate process.

Fumigation: Formaldehyde gas is commonly used to fumigate hatching eggs and to fumigate incubators. This method depends upon the reaction of 40% formalin solution and potassium permanganate crystals. This reaction is rapid and violent, and care must be taken to avoid skin contact with the chemicals or inhaling the fumes resulting from the reaction. The reaction produces heat and steps must be taken to avoid the risk of fire. The container should be metal and atleast 20 times the volume of formalin to be used so as to prevent chemicals overflowing during the reactions. The amount of formalin and potassium permanganate to be used will depend on the size of the incubator or chamber and the desired strength of fumigation. For effective fumigation, terminal gas concentration can be achieved by the reaction of 45 ml 40% formalin solution with 30 gm potassium permanganate crystals per m^3 of incubator or chamber space.

Common problems in hatchery:

Problem	Probable cause
Too many clears or infertile eggs	* Wrong proportion of male to female ratio * Male undernourished * Interference among the male during mating * Damaged combs and wattles among the males * Males too old * Sterility in male * Eggs are kept too long or under the wrong conditions
Blood rings (which indicate very early embryonic death)	* Incubator temperature too high or too low * Incorrect fumigation * Eggs are kept too long or under the wrong conditions
Many dead in shell	* Incubator temperature too high or too low * Eggs not properly turned * Faulty nutrition of breeding stock, if deaths are heavy in the 10^{th} to 14^{th} day * Faulty ventilation of the incubator * Pullorum disease or other form of infectious disease
Pipped eggs failing to hatch	* Insufficient moisture in the incubator * Too much moisture at earlier stages * Nutrition problem
Hatching too soon	* Incubator temperature too high
Hatching too late	* Incubator temperature too low
Sticky chicks	* Incubator temperature probably too high
Malformed chicks	* Incubator temperature too high * Incubator temperature too low * Eggs set incorrectly or not properly turned after setting
Spraddling of chicks	* Hatching trays too smooth
Weak chicks	* Over heating of incubator or hatching eggs
Small chicks	* Setting small eggs * Too little moisture in incubator
Heavy breathing chicks	* Too much fumigant left in the hatcher * Too much moisture in hatcher * Possibly infectious disease
Mushy chicks	* Low average temperature during period of incubation * Poor ventilation of the incubator * Omphalitis or navel infection
Hatch not coming at one time	* Setting eggs too diverse in age

Stress factors affecting meat quality in poultry: pre slaughter conditions

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Introduction: Poultry industry has grown into a major enterprise in last two decades in Indian. Currently India ranks fifth in eggs and ninth in meat production globally, respectively. In Asian sub continent India is second, only after China in poultry industry. Production of eggs & meat is growing annually at 8-10 % and exponential growth rate of market is 12-15 %. Agriculture contributes 40 % of Indian GDP, and livestock sector contributes 12 % of it. All this income is generated 70 % by organized & 30 % unorganized sector. In India, majority i.e. 60 % of farmers are involved in some or other ways with animal husbandry. Animal husbandry as supportive or primary industry has helped tremendously in improving the economic status of farmers in India. It is predicted that the poultry industry will grow from 1750 billion in 2018 to exponential 4340 by 2024. There is dominance of southern Indian states like Andhra Pradesh, Tamilnadu and Maharashtra contributing, 70 % of total egg & meat production. Poultry meat and eggs are high value food fulfilling the protein, fats, carbohydrates, mineral and vitamins of our diet. Daily consumption of animal meat and eggs is also recommended by Indian Council of Medical Research [ICMR] to maintain good health.

Reasons for rapid development of Indian poultry sector

*Involvement of large private enterprises

*Minimum government interference

*Good veterinary health monitoring

*Wide genetic native diversity of birds and improved hybrid vigour poultry

*Availability of poultry feed & equipments

*Increased per capita income/spending power

*Changing food habits

*Increasing urbanization

*Growth of food service markets

*Growth of bakery food market

*Organization of operations & investments in breeding, hatching, rearing & processing units

Despite major advances in the poultry industry in India, still there is annual loss of rupees 3.5 billions as the meat gets spoiled. In America this economic loss due to poultry meat spoilage is $ 125-165 Million. Meat quality is very important for consumer acceptance and storage as well as product preparations. Meat is evaluated by the a. sensory attributes like; color, texture, juiciness, taste, odour, softness/tenderness, by b. nutritional composition like; fats, protein, carbohydrates, vitamins and minerals and finally c. technical parameters like; pH, water holding capacity[WHC] and thawing loss. Other minor factors quality variables are absence of chemicals, microbial residues, antibodies, hormones, toxins, bacteria etc. For immediate consumer acceptance color and tenderness are most important attributes to be fulfilled.

Major reasons for meat spoilage

* Fasting [feed + water] the birds for long duration before, during and after transportation

*Improper, unscientific and inhumane handling of birds before, during and after transportation

*Overcrowding of birds before, during and after transportation

*Too long pre slaughter lariage time

*Keeping the birds in adverse conditions during and after transportation

*Heat stress to birds during transportation

*Unfamiliar environment

*Long Distance transport, subjecting the birds to nutritional, social and thermal stress

How meat gets spoiled

Heat stress, overcrowding, handling the birds cruelly and long distance transport are the major factors

responsible for significant stress on birds and reducing the meat quality. Overcrowding, rapid growth, hot environmental conditions, long transport time in hot climates predisposes the birds to thermal stress. Immediately the behavior, physiology and metabolism of birds change. Two hormones essential for acute or chronic stress adaptation are catecholamines and cortisol. Cortisol enhances lipid mobilization and deposition in abdominal, cervical and thigh region in birds which is not desirable. It increases protein degradation, catabolism and breakdown in skeletal muscles. Also, there is production of excess urate, reactive oxygen species/ free radicals [ROS] and decrease in pH. Heat stress causes release of cortisol for short or long time with all the mentioned phenomenon's and results into pale soft exudative [PSE] meat, especially breast and thigh muscles in birds. The PSE meat is unpleasant to look, decreasing the meat quality and value.

Similarly, oxidative stress damage cellular components, cell membrane lipids, proteins, enzymes structure and functions. These deleterious effects are manifested by ageing and loss of proteins, inactive proteins, DNA and RNA and decrease in pH. The ROS induced lipid degradation, changes the saturated and unsatura-ted fatty acids ratio. The degraded/oxidized lipids change meat color, aroma, flavor, texture, increase rancidity, unpleasant taste, reduce nutritive and storage quality and shelf life of meat. These changes result into PSE meat of inferior quality for consumption and storage and acceptability. Both higher levels of cortisol and ROS mediate unwanted post mortem metabolic changes and alter the meat quality.

When pre slaughter stress is for longer duration, anaerobic metabolism is activated utilizing all the stored muscle glycogen. Adequate glycogen depots are very important for the post mortem changes, which changes the muscle actin:myosin bonds and give meat its tenderness and juiciness after postmortem period is completed. Activation of alternative metabolic pathways rapidly produces lactic acid, decreases the pH, myoglobin oxidation and increased ROS production, which ultimately produce a dark firm dry [DFD] meat, which is less palatable and acceptable.

Short term heat stress results in PSE and chronic heat stress makes DFD type meat in birds. Both the types of meat are unacceptable for consumption, export, storage and product preparation. Alterations in pH changes, the cellular microenvironment and there is production of biogenic amines, depletion of minerals, vitamins, acidosis and dehydration resulting into nutritive and economic losses. Similarly, prolonged lariage times with fasting also induce stress, alter metabolic pathways, deplete all essential nutrients, cause cellular stress, produces biogenic amines which are potent carcinogens. These undesired changes reduce the meat properties and quality adversely, making it less nutritious for consumption, products and storage.

Heat stress induces panting as effective means of evaporative cooling for maintaining thermo regulation (body temperature). But panting leads to carbon-dioxide removal very quickly, leading to decrease in total body acid and bird slowly develop metabolic alkalosis. This higher pH is very favorable for microbial growth. Panting also increases energy/ ATP consumption and subsequently there is more muscle glycogen depletion for ATP generation by anaerobic glycolysis. Thereafter, there is increased lactic acid production, pH decreases to more acidic, leading to PSE like meat, which has less water holding capacity. Ultimately, these changes deplete essential meat nutrients and reduce storage quality.

Water holding property i.e. ability to hold indigenous water or added water is one of the most important characteristic of meat for product preparations and storage. WHC modulates the cutting, grinding, heating, pressing and other processes. The WHC is proportional to muscle fiber density, color and tenderness of meat. Increased acidity equals to low pH and PSE meat, which has decreased water holding capacity. More the water is lost during preparation, more the meat becomes drier and unsuitable for long term storage and spoilage increases economic losses. Tenderness/ shear force is also an important sensory parameter. Coarser the texture equals less softness and less acceptability. The tenderness of meat is directly proportional with total water, water holding capacity. Heat stress increases heat shock proteins as stress response which mediated essential cellular alterations but reduces the WHC and tenderness.

Understanding the stressors to prevent meat spoilage

A proper understanding of different stressors, especially heat stress, affecting poultry metabolism and altering meat quality and shelf life is essential. These stressors alone or combined together significantly reduce the meats nutritive quality. Other disadvantages are decrease in shelf life, accumulation of toxins and increase in microorganisms, which collectively affect the storage and meat products. The inferior quality meat is not acceptable to consumer, industries or for export leading to substantial economic losses. It is pertinent to understand poultry stressors comprehensively so that ameliorative measures can be adopted to optimize the meat quality, profits and deliver highest grade fresh meat and meat products to the consumer.

References

1. Ali SMD, Kang GH and Joo ST. 2008. A review: Influences of pre-slaughter stress on poultry meat quality. Asian Australian Journal of Animal science. 21(6):912-916.
2. Fouad AM, Chen W, Ruan D, et al. 2016. Imapct pf heat stress on meat, egg quality, immunity and fertility in poultry and nutritional factors that overcome these effects: A review. International Journal of Poultry Sciences. 15(3):81-95.
3. Goo D, Kim JH and Park GH et al. 2019. Effect of heata stress and stocking density on growth performance, breast meat quality and intestinal barrier function in broiler chickens. Animals. 9(3): 107
4. Xing T, Gao F and Tume RK et al. 2018. Stress effect on meat quality: A mechanistic perspective. Comprehensive Reviews in Food Science and Food Safety. 18(2):1-70.
5. Zaboli G, Huang Xi and Feng Xi et al. 2018.How can heat stress affect chicken meat quality-A Review. Poultry Science. 0:1-6.

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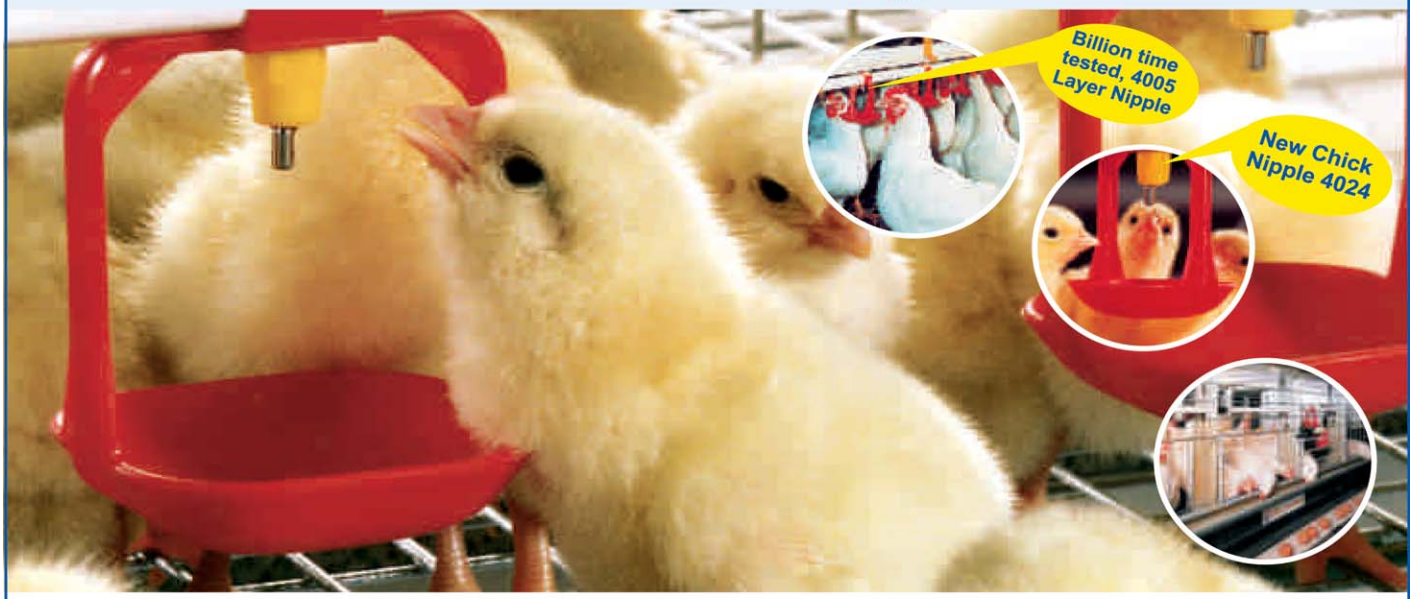

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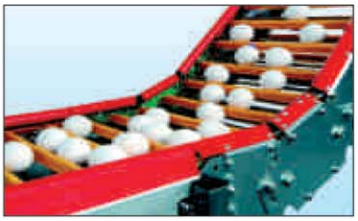

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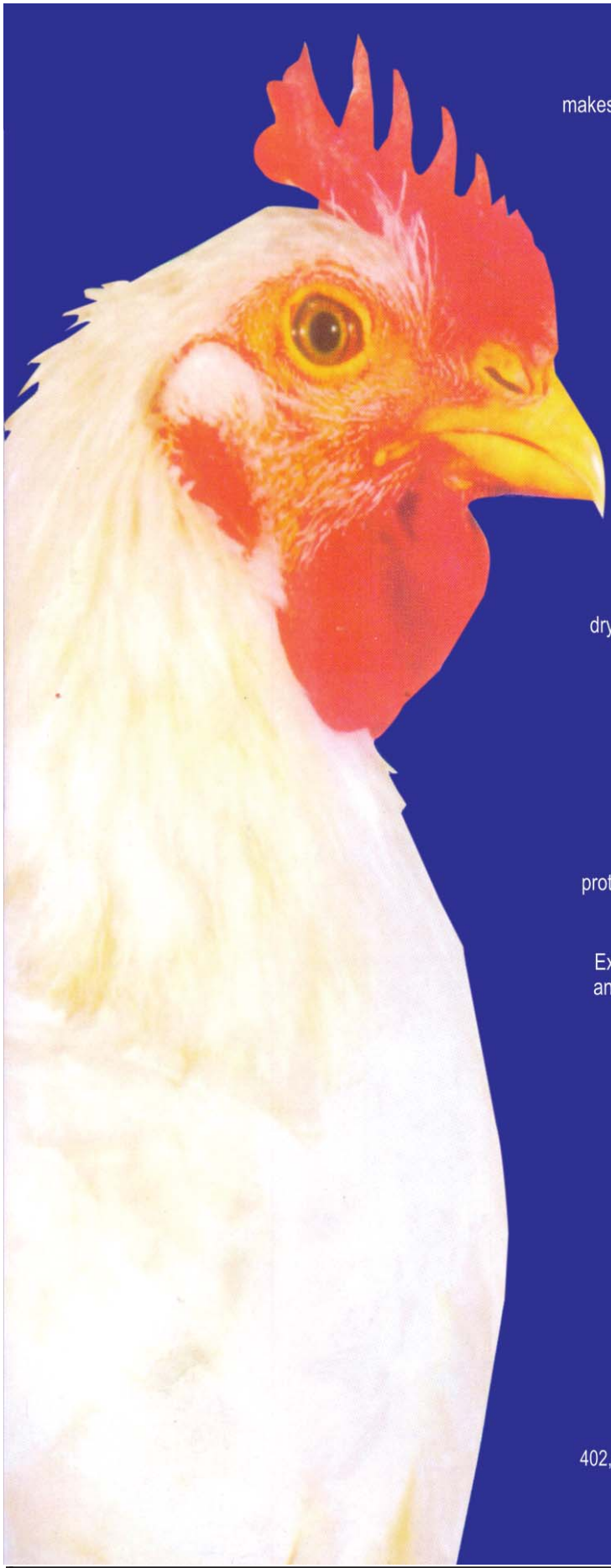

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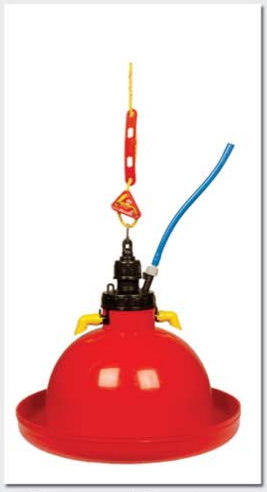

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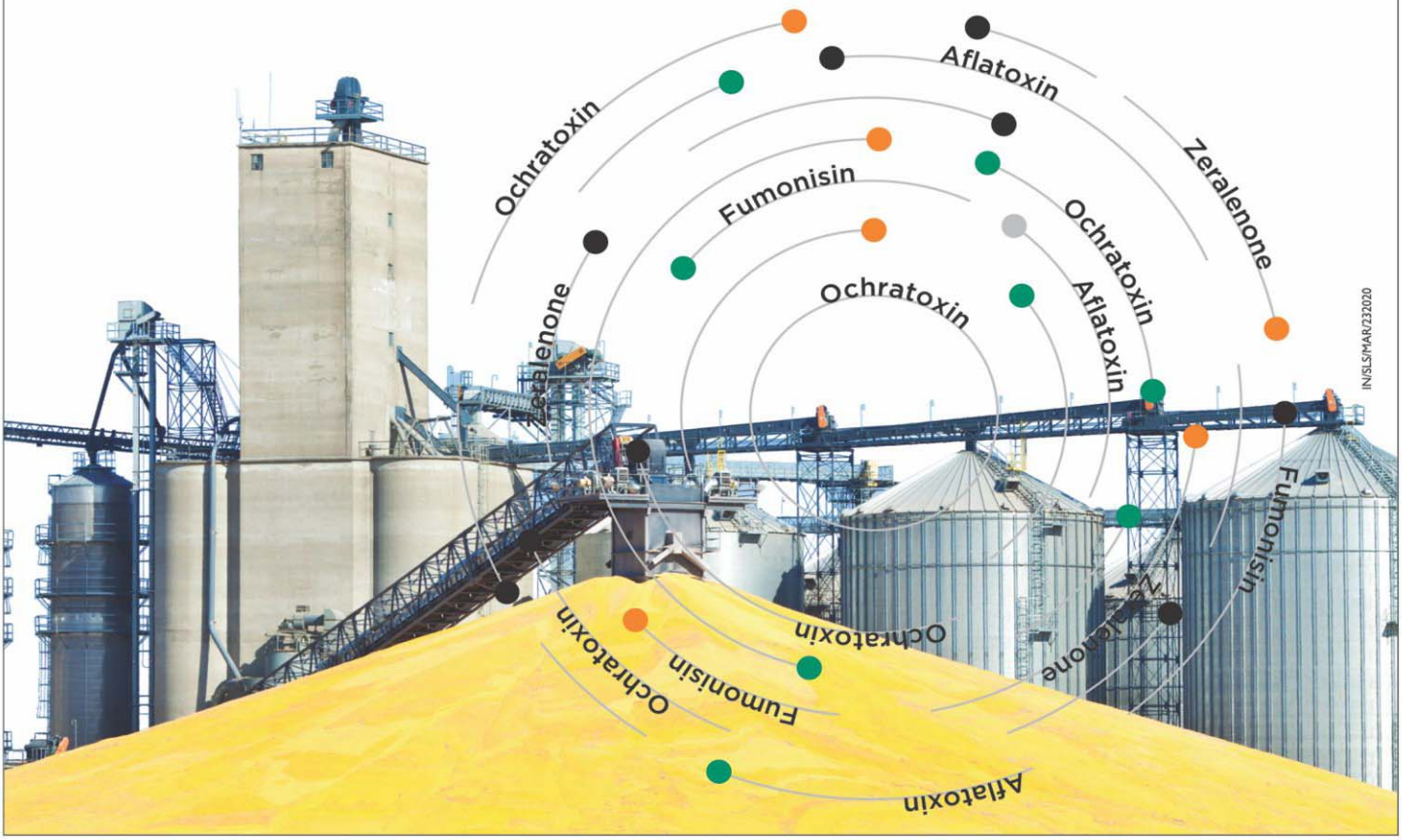

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