POULTRY TECHNOLOGY

A COMPLETE BUSINESS MAGAZINE FOR POULTRY INDUSTRY- CIRCULATED WORLDWIDE

PT

MAY 2026

VOLUME 21 ISSUE 1

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RNI No.: HARBIL/2006/18915 POSTAL REGN. NO. PKL-77/2024-2026

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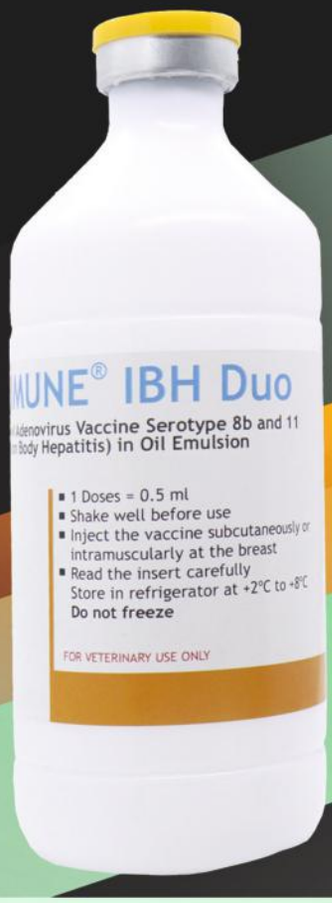

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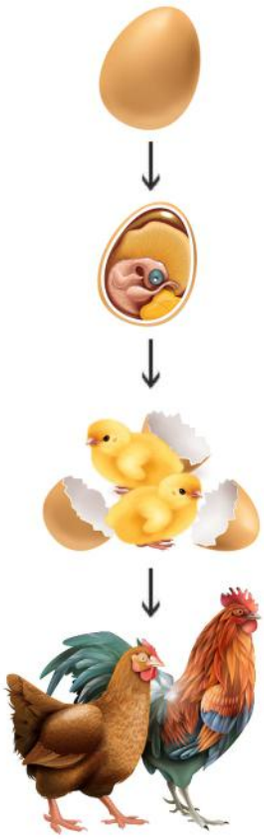

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From the Editor's Desk

Poultry's Double Challenge – Heat and War !!!!

The ongoing conflict between the US and Iran has severely disrupted global shipping movements. Beyond the direct impact of rising oil and gas prices, the largest disruption has been in the prices of raw materials across almost all commodities. Panic buying has further exacerbated this crisis, forcing farmers to make several adjustments to cope with the situation.

Pakistan, now perceived as a mercenary country, has become available to anyone who pays the price. It has attacked the Taliban on behalf of America and has not hesitated to attack Palestinians for financial gain, all while maintaining a defense pact with Saudi Arabia. Now, America is utilizing its military bases to launch attacks on Iran. The complexity of this war has led to hesitation among mediators. Pakistan maintains a poor relationship with Iran, a suspicious relationship with Saudi Arabia, and a hatred towards Israel, all while nurturing monetary ties with America. Despite this complicated backdrop, Pakistan speaks of mediation, yet one of the main warning countries is not even a participant. The generals who essentially govern Pakistan are running the country based on deals.

Farmers are also struggling with the extreme summer heat affecting India. Meteorological forecasts predict much higher temperatures in India compared to the rest of the Asian continent, and this heatwave is expected to last about two weeks. Farmers are experiencing heat stress, leading to lower feed consumption and higher mortality rates among livestock. The skyrocketing prices of amino acids have further increased costs. Farmers must take extra precautions to test all products, including feed, additives, and weather conditions—both imported and local—due to shortages and summer conditions. The consumption of eggs and chicken is negatively impacted by the high temperatures, coupled with local habits. Additionally, with seasonal trends causing lower prices for eggs and chicken, can farmers utilize cold storage to mitigate these low prices?

Furthermore, there has been a shocking revelation in western India about a corporation resorting to clandestine and coerced conversions through various means. It would be preferable for a religion to attract individuals based on merit rather than through pressure and coercion. An open-minded religion should allow individuals to choose voluntarily, rather than being driven into acceptance by force. No religion should endorse or encourage violence in the pursuit of faith.

The alternating closures and openings of the Strait of Hormuz have kept the global community on edge. This kind of blockage of such a vital passage is a concerning precedent that should not be encouraged. There are several critical straits around the world, and none should be jeopardized by a single country unilaterally seizing control, causing disruption in global trade.

Editor

SR Publication

Publisher:

POULTRY TECHNOLOGY
LIVESTOCK TECHNOLOGY

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Head's	FLOCK 01	FLOCK 02	FLOCK 03	FLOCK 04	FLOCK 05
No. of Chicks	4959	6160	4900	5050	5300
Date of Arrival of Chicks	01.04.2025	19.05.2025	02.07.2025	01.09.2025	30.11.2025
Weight of Chicks (Gm)	42	44	43	43	43
FCR at Approx. 2 Kg B/W	1.115	1.096	1.117	1.109	1.107
Total Weight of Sold Bird	10500	12450	12400	12127	12781
Total No. of Birds Sold	4200	5900	4600	4870	5088
Average Weight per Birds (Kg)	2.500	2.110	2.696	2.488	2.512
Total Feed Consumed (Kg)	14000	18500	17750	15100	16000
FCR (Kg)	1.333	1.486	1.431	1.245	1.252
CFCR (Kg)	1.208	1.457	1.266	1.115	1.124
REMARKS	LPAI* - Out Break occured on 8th day, but checked on 9th day, inspite of that progress was better than the standards.	Inspite of peak summer and rates, control feeding was done to delay the growth.	Flock was kept on control feed, due to poor rate to delay the production.	Flock was kept on control feed, due to poor rate to delay the production.	Mean age 35 Days.
PRODUCT USED					
Nutrigrow & Multimune	1-10 Days (50 Gm + 5 Gm) per 1000 Birds				
Respamune	SPRAY – 1 - 10 days every day than every 3-4 days 1 ML per litre water				
Readymune (Regular by)	Day 1 till Marketing @ 50 Gm Per 1000 Birds				
Calface	On achieving 1.2 Kg B/W @25 Gm per 1000 Birds X 5 Days				
Respafeed	@ 1 Gm Per Litre Water (Day 1 till Marketing Or 500 Gm per Ton Feed)				
Intermune	@10 Gm per 1000 Birds on 12,13,14 Day				
	@20 Gm per 1000 Birds on 22,23,24 Day				

* NOTE - NO VACCINE OR ANTIBIOTIC WAS GIVEN AT ANY STAGE.

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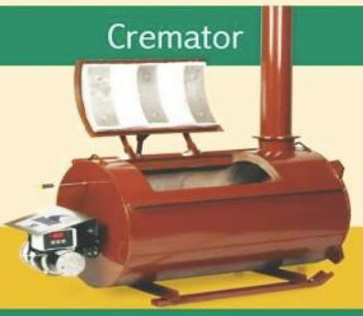

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A COMPLETE BUSINESS MAGAZINE FOR POULTRY INDUSTRY- CIRCULATED WORLDWIDE

MAY 2026 VOLUME-21 ISSUE-1

RNI NO. HARBIL/2006/18915

Contents **Page No.**

Legend SERIES 27

Dr PK Shukla
Prof and Head Poultry Science and the Director, Institute of Para Veterinary Science DUVASU Mathura

Page No. 46-47

Owned, printed, published & edited by Jyoti Arora C/o S.R. Publications, published at 1325, 2nd Floor, Sector 32, Near Hotel Noor Mahal, Karnal. Printed at Khattar Printing Press, Railway Road, Karnal - 132 001 (Haryana)

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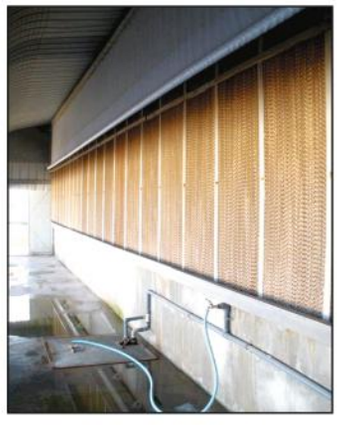

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Last review date: 09/08/2024

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एनकाउंटर नंबर-274 मसालों के नाम पर जहर की सप्लाई - कई कंपनियों के मसालों मे मिले कीटनाशक-सैंपल टैस्टिग में सामने आया सच। क्या सचमुच यह सच है?

सच है या गलत, इसका निर्णय लेने वाले हम कोन होते है? न ही हमे पावर है ओर न ही हम वैज्ञानिक है कि हम इस पर कोई उपदेश दे सके। बहरहाल यह तो सच है कि हमारे देश के बहुत से मसाला निर्यात करने वाली कंपनियों के उत्पाद विदेशी सरकारों ने वापस कर दिया है कि उसमे पेस्टिसाईडस ओर बहुत से दूसरे केमिकल्स मिले है जो उपभोक्ता के शरीर को भिन्न भिन्न प्रकार से हानि पहुंचा सकता है बल्कि पहुंचा रहा है।

''वापस आया तो गया कहाँ? हमारे बाजार में पहुंचा ओर हमारी 'चटोरी जबान' ने इस जहर को खरीद कर खाया। यह सिलसिला जारी है। हमारे बाजार मे उपलब्ध है हम खा रहे है। जो विदेशों से वापस आ रहा है हम उसे भी खा रहे है। यही यदि अंडा ओर चिकन होता तो 'भोंपू मीडिया' ने इतना इसके खिलाफ शोर शराबा किया होता कि अंडा चिकन लोग खाना छोड़ देते।

भिन्न भिन्न समय पर भिन्न कंपनियो के नाम आए है। लगभग सभी बड़ी 'मसाला' कंपनी इस मामले मे शामिल है।

इसके अतिरिक्त हर शहर, तहसील ओर कस्बे मे छोटे छोटे 'मसालची' है जो अपना ब्रांडेड या खुदरा मसाला बेचते है। इनका नाम तो नही आया पर वह भी अछूते नही है। क्योंकि उनका भी सोर्स सामग्रियों का वही किसान है जो बड़ी कंपनियों का है। अभी हाल ही में एक रिपोर्ट के मुताबिक कानपुर के खाद्य सुरक्षा एवं औषधि प्रशासन विभाग ने छापा मारा। 14 कंपनियों के लगभग सभी भिन्न-भिन्न मसालों में पेस्टीसाइड की मिलावट मिली। उम्मीद है की फैक्ट्री में पेस्टीसाइड नहीं मिली होगी हां मसाले में पड़ने वाले भिन्न पदार्थों में शायद उसे कीट से बचाने के लिए किसानों ने मिलाया हो। इसकी सुरक्षा की गारंटी तो किसान ही दे सकता है ना कि उपभोक्ता।यह मसाला फैक्ट्री भी बड़ी उपभोक्ता है। हां यदि फैक्ट्री में पेस्टीसाइड की बोरी मिली है तो यह निश्चित रूप से संगीन जुर्म होगा। यह कानपुर केस कोर्ट में जाने वाला है या चला गया होगा यदि उत्तर प्रदेश सरकार ने आज्ञा दी होगी।

यदि इजाजत नहीं मिली तो समझ जाइए इसमें जरूर कुछ..

काफी दिनों से इस मामले पर चर्चा देश के अंदर और देश के बाहर भी है। हम क्यों नहीं किसानों को बायोपेस्टिसाइड के उपयोग के बारे में समझाते यदि उसमें दम है। यह मानव के सेहत से जुड़ा हुआ मुद्दा है सरकार को इसे गंभीरता से लेना चाहिए। किसानों को निरंतर इस बायोपेस्टिसाइड पर ज्ञान बांटते रहना चाहिए। ध्यान रहे बड़ी से बड़ी मसाला कंपनी इस आरोप से बची नहीं है।

एनकाउंटर नंबर 275:- सपना विकसित भारत का, कब और कैसे हकीकत बनेगा?

इसमें कोई शक नहीं आजादी के बाद से निरंतर भारत हर क्षेत्र में प्रगति करता आ रहा है। हम एक प्रकार से कृषि क्षेत्र से जुड़े हुए हैं अतः इस लेख मे सारी बातें उसी क्षेत्र को लेकर होगी।

हमारे अधिकांश पाठकों को पता ही नहीं होगा कि आजादी के बाद और बंटवारे के बाद देश में जब जबरदस्त अनाज की किल्लत हो गई थी। सबसे अधिक अनाज उपजाने वाला भाग बंटवारे के साथ हमारे हाथ से निकल गया था। जब किल्लत होती है तो इसमें अधिकांश के लिए मुश्किल और चंद पूंजीपतियों के लिए बहुत अधिक फायदे की बात होती है क्योंकि वह स्टॉक अंडर ग्राउंड कर लेते हैं। सरकार के लिए समस्या खड़ी हो गई। सरकार ने तुरंत 'कंट्रोल' की दुकाने हर शहर, तहसील और कस्बे में खोल दी। सरकार के पास खजाने मे रुपए में भी कम थे। इसके बावजूद सरकार ने आयात करना शुरू कर दिया। कुछ खरीदा कुछ अनुदान भी आया। इसे देखते हुए स्टोकिस्ट के चेहरे भी फीके पड़ गए – सरकार ने रेड भी करना शुरू कर दिया – छुपा माल बाहर निकलना शुरू हो गया। सरकार ने उपज बढ़ाने के लिए बीज – खाद के अतिरिक्त सबसे महत्वपूर्ण बात नहरों और नालों का पूरा जाल बिछाया खेतों की सिंचाई के लिए। जहाँ नहर नहीं बनी वहाँ ट्यूबवेल विभाग ने नाले बनाकर खेतों तक पहुंचाया गया । I.C.A.R ने उत्पादन बढ़ाने के लिए बढ़िया किस्म के बीजों का उत्पादन अपने रिसर्च द्वारा शुरू किया। गेहूं का उत्पादन बढ़ाने के लिए डॉक्टर स्वामी नाथन के योगदान को कोई भूल नहीं सकता।

नेहरू जी के लंबे कार्य के बाद जब स्वर्गीय लाल बहादुर शास्त्री ने कुछ समय के लिए प्रधानमंत्री की गद्दी संभाली तो उनके नारे 'जय जवान – जय किसान' ने कृषक समाज में जान फूक दी। दुखद है शास्त्री जी बहुत थोड़े समय में ही अपनी अंतिम यात्रा पर निकल गए।

गंगा फीड का एक ही लक्ष्य – समृद्ध व सम्पन्न हो फार्मर हमारा ।

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(A Unit of Ganga Hatcheries)

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- Better immunity, less mortality.
- No need of additional medicine.
- Better digestibility and availability.
- Best quality feed at economical price.
- Our Feed is processed with modern equipments.
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इसके बाद इंदिरा जी प्रधानमंत्री बनी। भारत में उपज बढ़ना शुरू हो गया परंतु उससे पूरी आपूर्ति नहीं हो रही थी। गेहूं मुख्य रूप से आयात करना पड़ रहा था। आता था खाने के लिए परंतु अमरीकी गेहूं होने के कारण इसे बीज के तौर पर इस्तेमाल करने लगे। कुछ ऐसे आए जिसमें खरपतवार (Weed) के बीज भी थे। हमारे खेतों को इस वीड ने अपना घर बना लिया जिसे किसान इन्द्रा गांधी ग्रास के नाम से जानने लगे। भला करे I.C.A.R ने बड़ी मशक्कत से इस वीड को जड़ से खत्म किया। नए बीज का वितरण हुआ। आयात खत्म हुआ और भारत अनाज में स्वालंबी ही नहीं बना बल्कि निर्यात भी करने लगा। यह है विकसित भारत के कृषि जगत का संक्षिप्त विवरण।

परंतु खेद है कि पिछले कई सालों से करोना के बाद से सरकार 80 करोड़ लोगों को मुक्त अनाज दे रही है। अर्थात 80 करोड़ लोग इतना भी नहीं कमा पा रहे कि स्वावलंबी बने और अपनी जीविका चला सके।यह 80 करोड़ लोग हमारी कुल आबादी के आधे से ज्यादा है। जब तक यह स्वावलंबी नहीं बनेंगे हम कैसे विकसित भारत बना पाएंगे?

हमारे लगभग सभी इंस्टीट्यूशन I.C.A.R, I.V.R.I, C.A.R.I– यूनिवर्सिटीज काफी रिसर्च करती रहती है हर वर्ष काफी नए आयाम आ जाते हैं परंतु क्या यह किसानों तक समय रहते पहुंचते हैं? शायद 20: भी नहीं। कृषि जगत में जरूरत अधिक है और कुछ किसान काफी जागृत हो चुका है। हम पोल्ट्री से जुड़े हैं हम जो कुछ कर रहे हैं वह सब लगभग 'बड़े पापा' अमेरिका की देन है। वैसे तो हमारे यहां के इंस्टीट्यूशन आजादी के बाद से काफी पोल्ट्री या यूं कहिए पोल्ट्री एवम पशुपालन पर रिसर्च कर रहे हैं। दुखद है उनकी उपलब्धियां मैदान में नहीं उतर रही है या अगर उतरी है तो कहीं दिख नही रही है। अभी हाल ही में 'मामा' श्री शिवराज सिंह चौहान ने वाराणसी दौरे के दौरान शाहजहांपुर I.I.V.R – (इंडियन इंस्टीट्यूट आफ वेजिटेबल रिसर्च) के सेंटर का दौरा किया।

प्रगति से खुश थे। टाइम्स ऑफ इंडिया में रिपोर्ट पढ़ कर हमें भी अच्छा लगा कि माइक्रोबियल बायो फर्टिलाइजर, बायो स्टिम्युलेंट और बायोपेस्टिसाइड सेंटर ने डेवलप कर दिया है। यह हर्ष का विषय है। पता चला मंत्री महोदय के विजिट के बाद। वरना हम सबको पता भी नहीं चलता। श्री चौहान ने कहा कि 'ब्रीमैटो' बैंगन और टमाटर एक ही पेड़ से और 'पोमैटो' आलू + टमाटर एक ही पेड़ जैसी तकनीक किसानों तक पहुचनी चाहिए। यह बात पोल्ट्री इंडस्ट्री मे हम लोग बहुत दिनों से कहते आ रहे हैं जो हमारे वैज्ञानिक रिसर्च पर हमारे टैक्स का पैसा काफी खर्च कर रहे हैं। उसकी उपलब्धियां पोल्ट्री इन्डस्ट्री तक पहुंचना चाहिए। ऐसी रिसर्च का क्या फायदा जो फाइल में बंद पड़ी रहे?

हम अपने आसपास के इंस्टीट्यूशन के विशेषज्ञों के नाम नहीं जानते परंतु कर्नाटक, तमिलनाडु, आंध्र प्रदेश के विशेषज्ञ का नाम रटा पड़ा है।वह समय–समय पर भारत के पोल्ट्री क्षेत्रों का भ्रमण करते रहते हैं और ज्ञान बांटते रहते हैं। उनका एक्स्पोजर बहुत बड़ा है। हम लोग सदैव I.V.R.I और अब C.A.R.I से बहुत अधिक उम्मीद रखते हैं। रिसर्च हो भी रही है परंतु बाहर कुछ भी नहीं दिखता।

एक पुरानी बात याद आ गई उस समय डॉक्टर A.P. Sachdev (इनकी उम्र लंबी हो) बहुत एक्टिव थे। एक बड़ी टीम लेकर एक प्रतिष्ठित इंस्टीट्यूशन में गए। उसमें मैं भी था। दो दिन का प्रोग्राम था। अच्छा इंट्रैक्शन रहा। कुछ अलग फीड फार्मूले पर ब्रायलर की अलग–अलग ग्रोथ आ रही थी। एक फॉर्मूले पर बहुत अच्छी थी। इस पर चर्चा हो रही थी। हम लोगों ने कहां फीड फॉर्मूला बता दें। यह बात बीच–बीच में कई बार दोहराई गई। स्टेज में एक वैज्ञानिक ने बिना सिक्के के "हेड टेल" का इशारा किया अर्थात् पैसा लगेगा। बताइए हमारे पैसों पर आप इंस्टीट्यूट चला रहे हैं – रिसर्च कर रहे हैं इसके बावजूद पैसा मांग रहे हैं?

विश्व में सबसे अधिक पोल्ट्री मैगजीन भारत में छपती है। इसमें भी सबसे ज्यादा करनाल से निकलती है। कम एक या दो पेज C.A.R.I और I.V.R.I के नए–नए कार्यकलापों पर होने चाहिए। यहाँ तो अधिकांश विदेशी खबरें होती है भारत में उनकी कंपनियों के द्वारा । यहाँ भी लगता है पैसों का मामला है क्या? भारतीय पोल्ट्री इंडस्ट्री के हित में हमारे संपादकों को इतना बलिदान तो करना ही चाहिए । माध्यम और भी है जिसे आप फ्री में उपयोग कर सकते हैं। हमारे प्रमुख इंस्टीट्यूशन विशेषकर I.V.R.I, C.A.R.I एवं N.D.R.I व्हाट्सएप द्वारा भी समाचार दे सकते हैं। बहरहाल हमें ज्ञान विज्ञान की बहुत आवश्यकता है – कुछ आप आगे बड़े कुछ इंडस्ट्री आगे बढ़े ताकि एक आदान–प्रदान का संवाद शुरू हो।

एनकाउंटर नंबर 276 – आभागी पोल्ट्री पर हर बार अफवाह का बाजार क्यों गर्म हो जाता है? क्या पोल्ट्री ही अकेली (A.M.R.) एंटी माइक्रोबियल रेजिस्टेंट की जिम्मेदार है?

सन् 2025 दिसंबर का दूसरा सप्ताह था 2–3 फोन आए कि "अंडा खाएं या ना खाएं"? साथ में उन्होंने स्वयं कारण भी बता दिया कि अखबार में, इलेक्ट्रॉनिक भोंपू मीडिया और व्हाट्सएप में मैसेज आ रहे हैं कि अंडा खाने से कैंसर होता है।

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Breeders - 2 kg per tonne of feed

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यह बहुत दिनों बाद साल आया था कि जाड़ो में अंडों का भाव बहुत तेज रहा। आशा थी दिसंबर जनवरी में होलसेल रेट 7 रूपये के पार रहेगा। इस एक खबर ने रेट बढ़ना तो छोड़िए बहुत तेजी से घटाना शुरू कर दिया। दुखद है देश में स्वार्थी एजेंसी है जो रेट निकालती है जिसमें N.E.C.C और आडती रूपी दलाल शामिल है। जब बढ़ाना होता है बड़े धीरे कम पैसों के साथ बढ़ाते हैं और घटाना होता है चवन्नी–अठन्नी के साथ रोज घटाते हैं। दिसंबर में ही इंडस्ट्री लगभग धराशाही हो गई। हो सकता है कि इसमें कोई साजिश हो क्योंकि अंडे का रेट तेजी से बढ़ता ही जा रहा था। बहरहाल जिनका फोन आया था उनको समझा दिया कि यह अपवाद है अफवाह है।

जिन अंडों में मिला है वह परमीसिबल लेवल से काफी कम है अतः कोई चिंता की बात नहीं। वैसे भी भारत में भिन्न–भिन्न एंटीबायोटिक या नाइट्रीफ्यूरान का उपयोग बहुत कम होता है। यदि होता है तो वह मानक से काफी कम होगा।

यह अफवाह जो फैली है वह EGGOZ के ब्रांडेड अंडों को लेकर फैली। यह कंपनी चंद सालों की है और नौजवान पढे लिखे लोगों ने शुरू किया है । बहुत जल्दी देश के काफी भागों में यह फैल गया। इनके अंड़े टैस्ट के लिए किसी ने भेजा। वह कौन लोग हैं प्रश्न चिन्ह है ? बहरहाल एफएसएसएआई जागी उन्होंने पाया जिस मात्रा में नाइट्रोफ्यूरान मिला है वह परमीसिबल लेवल से काफी कम है । अतः इससे कैंसर होने नहीं जा रहा और अण्ड़े भी टेस्ट हुए परंतु ऐसा कुछ भी नहीं पाया गया जिससे चिंता की जाए । यह कोरी अफवाह थी और शरारती तत्वों द्वारा भ्रम फैलाने के लिए किया गया । सरकार को छानबीन करना चाहिए इन देश प्रेमियों को सामने लाया जाए।

एक बात जरुर कहना चाहूंगा यदि आप वास्तव में अच्छा डिजाइनर एग ब्रांडेड बेचना चाहते हैं तो उसका उत्पादन स्वयं करें नहीं तो सदैव एक जोखिम रहेगा – किसान स्वयं फीड बनाता है कि नहीं ? यदि बाहर से फीड लेता है तो वह क्या–क्या डालता है आपको कैसे पता चलेगा। कोई एंटीबायोटिक डालता रहता है क्या? जो आप चाहते हैं कि आपको ब्रांडेड एग में बढ़ चढ़कर रहे उसका तो प्रीमिंक्स आप उसे दे देंगे लेकिन क्या क्या पड़ा है जो नहीं पड़ना चाहिए था वह आपको नहीं पता चलेगा। बहरहाल अगर अंडा दूसरे फार्मो पर बनवाना है तो आपको फीड फॉर्मूला की पूरी जानकारी रखनी होगी या आपके भरोसे का आदमी फीड बनवा कर भेजें।

भ्रम तो पैदा कर ही दिया गया। अभी कुछ दिन पहले एक और अफवाह पटना से फैलाई गई ब्रायलर को लेकर जिसमें चौंकाने वाली बात कही गई। ''हार्मोन के इंजेक्शन से 40 ग्राम का बच्चा 3 सप्ताह में 2 से 2.5 किलोग्राम का तैयार कर रहे हैं ब्रायलर फार्मर ।'' कुछ इसी तरह की खबर थी वह भी दैनिक भास्कर जैसे अखबार में।

सही शब्द मुझे याद नहीं मैंने उसका सार लिखा है। यदि यह सच है तो कैमरा लेकर उनका रिपोर्टर क्यों दिन भर धूल खाता रहता है। वह भी ब्रायलर पाल ले, ढाई से तीन लाख हर महीने कमा लेगा और क्या चाहिए। इस हार्मोन की अफवाह ने भी बाजार में भ्रम फैलाया भाव भी घटा किसानों को नुकसान भी हुआ। कहते हैं अफवाह बहुत तेजी से फैलती है और हकीकत बेचारी लड़खड़ाते हुए पहुंचती है जब तक नुकसान हो चुका होता है। इस बार भी ब्रायलर का रेट ऊंचा जा रहा था। जिसे गिराने की साजिश रची गई।

कौवा मरा, बत्तख मरी, मोर मरा, केरल में, हमारे भोंपू चैनल दिखा रहे हैं एक पोल्ट्री शेड स्क्रीन पर बता रहे हैं रहे यह तीनों पक्षी ए आई से मरे। बताइए पोल्ट्री इस बीच में कहां से आ गई। इस भोपू मीडिया को अफवाह फैलाने में शैतान की तरह आनंद बहुत आता है। सच हो या झूठ इससे उन्हें कोई फर्क नहीं पड़ता है।

टाइम्स ऑफ इंडिया में एक इंटरव्यू एम्स के वैज्ञानिक डॉक्टर हीतेन्द्र गौतम, माइक्रोबायोलॉजी के प्रोफेसर का आया पूरा पढ़ा।

उन्होंने एक अच्छे वैज्ञानिक होने के नाते बहुत से बिन्दुओं पर प्रकाश डाला जिसमें एक बिंदु मीट, अंडा और दूध भी था। परंतु हेडिंग में देखिए "Antibiotic over used in farms is bringing resistante bacteria straight into our gut." हेडिंग देखकर मैं चौंक गया, पढ़ा परंतु जब पूरा पढ़ा तो पता चला कि बहुत से ऐसे छेद हैं जिन्हें प्लग करने की जरूरत है इसमें सिर्फ मीट अंडा दूध ही नहीं है।

पोल्ट्री इंडस्ट्री काफी जागरुक है। लगभग दो दशक से सभी बड़ी फार्मा कंपनियां नॉन एंटीबायोटिक ग्रोथ प्रमोर्ट्स पर काम कर रही हैं और फील्ड में पिछले 10–15 साल से बहुत से ऐसे प्रोडक्ट आ गए हैं। खुद मैंने बहुत से ट्रायल गुरुग्राम स्थित ट्रायल फार्म पर इन प्रोडक्ट्स का कंपैरिजन एंटीबायोटिक के साथ किया है। लगभग सभी बेहतर रहे या बराबर रहे। यही नहीं हर्बल कंपनी भी प्रोडक्ट्स लाई जिसमें दो प्रोडक्ट्स काफी कारगर हुए।

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रहा सवाल किसी बीमारी के आने पर ट्रीटमेंट का। आमतौर से यह चार से पांच दिन का होता है जिसमें एंटीबायोटिक का उपयोग करना पड़ता है अगर यह भी AMR (एंटीबायोटिक माइक्रोबॉयल रेजिस्टेंट) पैदा करता है तो हमारी मजबूरी है हम कोशिश करते हैं कि वह एंटीबायोटिक उपयोग में ले जो मानव के इलाज में नहीं इस्तेमाल होता है।

यहां एक सच्चाई लिखने में कोई संकोच नहीं। गुड़गांव स्थित बजाज फार्म के संजय बजाज अपने ब्रांडेड डिजाइनर अंडों की बड़े स्केल पर मार्केटिंग करते हैं लगभग डेढ़ लाख लेयर होगी। अपनी ही फीड़ मिल है चार लोकेशन पर फॉर्म है । कई दशक तक उनसे जुड़ा रहा । जैसा पोल्ट्री में होता है कभी–कभी समस्या आ जाती है । हम लोग ट्रीटमेंट के लिए कोई एंटीबायोटिक लिख देते हैं संजय कुछ देर उस पर सोचते थे क्योंकि उन्होंने पैक पर एंटीबायोटिक फ्री एग लिखवा रखा है । ''कहते है मुझे कुछ समय दीजिए''। दूसरे हफ्ते जब हम गए सब कुछ ठीक । संजय प्रोबायोटिक के रसिया है उसकी खुराक बढ़ाकर सब ठीक कर लिया । किसानों की बहुत बड़ी संख्या जो कि प्रतिदिन बढ़ ही रही है एंटीबायोटिक के इस्तेमाल से कतराते हैं।

हार्मोन की बात कर लेते हैं। यह तो भोंपू मीडिया है जिसके कारण किसानों को इस हारमोन का पता चला। अधिकांश तो इसके बारे में कुछ जानते ही नही ।

करीब 30 साल पहले की बात है एक बड़े ब्रायलर फार्म के पास एक फैक्ट्री थी जहां Oxytocin बनती थी, हर हफ्ते उस फार्म पर जाता था । एक दिन उस फैक्ट्री के मालिक अपने गेट पर खड़े थे मुझे रोक लिया । कहने लगे हमारे पास एक प्रोडक्ट है जिससे दूध बढ़ जाता है, लौकी में शाम को लगा दो दूसरे दिन देखो कितनी लंबी हो जाती है, इसे ब्रायलर में लगाकर देखें क्या होता है। ना चाहते हुए मैंने कहा ट्रायल कर लेते हैं । 100 – 100 ब्रायलर के तीन ग्रुप बनाए एक में नहीं लगाया दूसरे का एक शॉट दिया तीसरे को तीन बार रिपीट किया हर सप्ताह । अंत में जब तौला गया तो कोई अंतर नहीं था । तौल भी फैक्ट्री मलिक को बुलाकर किया । उनसे मैंने कहा कि अगर यह वजन बढ़ा सकता तो गाय भैंस को रोज दो बार दूध निकालने से पहले लगाया जाता, वह अब तक हाथी के बराबर हो जाती । हमारे आपके हर पक्षी या जीव के शरीर में स्वयं कुछ हार्मोन का उत्पादन होता है रहता है जिसकी शरीर को आवश्यकता है।

अब बात इतनी बढ़ गई है आईसीएमआर की रिपोर्ट को लेकर प्रधानमंत्री श्री मोदी ने ''मन की बात'' में इस गंभीर विषय AMR एंटी माइक्रोबियल रेजिस्टेंट पर चर्चा की है और देशवासियों को जागरूक किया है कि एंटीबायोटिक का प्रयोग अपने आप ना करें डॉक्टर की सलाह से ही करें। हकीकत है आज क्या हो रहा है, हम स्वयं जाकर दुकान से एंटीबायोटिक खरीद कर अपना इलाज करने लगते हैं।

यदि आपने प्रधानमंत्री का पूरा भाषण सुना या अखबारों में पढ़ा हो तो यह कटु सत्य है

पोल्ट्री में ऐसा अक्सर होता है चूजा आते ही किसान अपनी मनमर्जी का एंटीबायोटिक लगाना शुरू कर देता है जरूरत हो या ना हो । दुर्भाग्य से हमारे कुछ डॉक्टर भी इस तरह के ट्रीटमेंट की सलाह देते हैं । हमारे पास कुछ ऐसे नॉन एंटीबायोटिक प्रोडक्ट हैं जिनके जरिए आप अच्छा उत्पादन ले सकते हैं । हम एंटीबायोटिक के पीछे क्यों हाथ धोकर पड़े हैं । हां, कभी–कभी किसी बीमारी के इलाज में आवश्यकता हो सकती है ।

सही डोज निर्धारित समय तक देकर बंद कर दें । ध्यान रहे यह अंडा या चिकन हम, आप और हमारे बच्चे भी खा रहे हैं।

एक बात जो बहुत महत्व की है जिस भारत सरकार एंवम ICMR का ध्यान आकर्षित करवाना अत्यंत आवश्यक है। लगभग सभी दवाईयां चाहे वो आदमी की हों, जानवर की हो या पोल्ट्री की हों एक सुनिश्चित तापमान में ही रखना चाहिए। क्या हमारे सभी दवाईयों के स्टोर इसका पालन करते है ? अधिकांश नही । इस पर ध्यान देना अत्यंत आवश्यक है। ऐसा न करने पर पोटेंसी का घटना निश्चित है जो ड्रग रजिस्टेंट का एक कारण बन सकता है।

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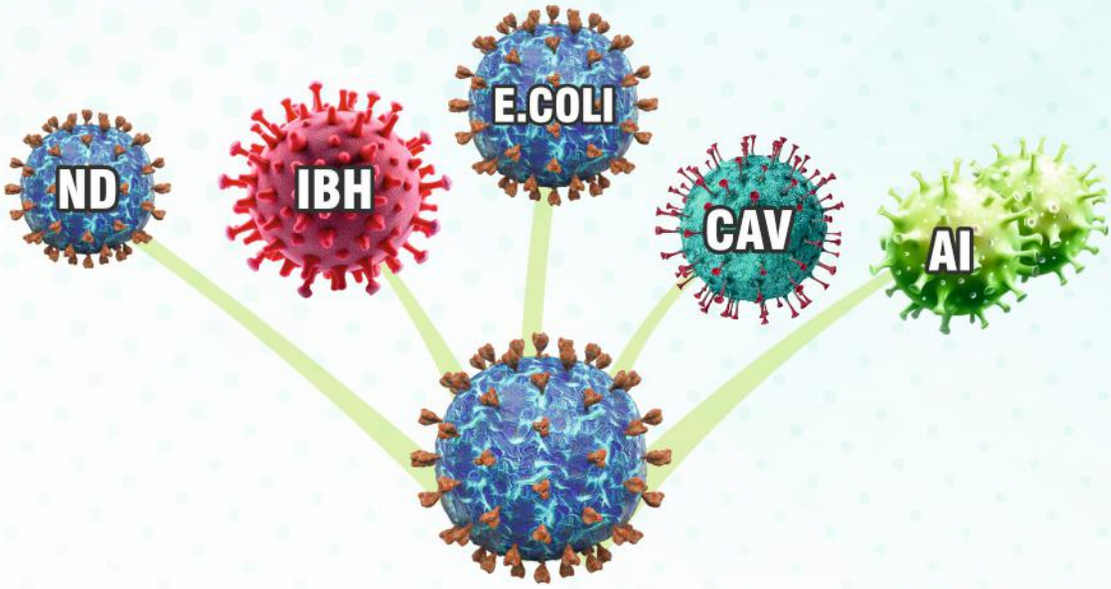

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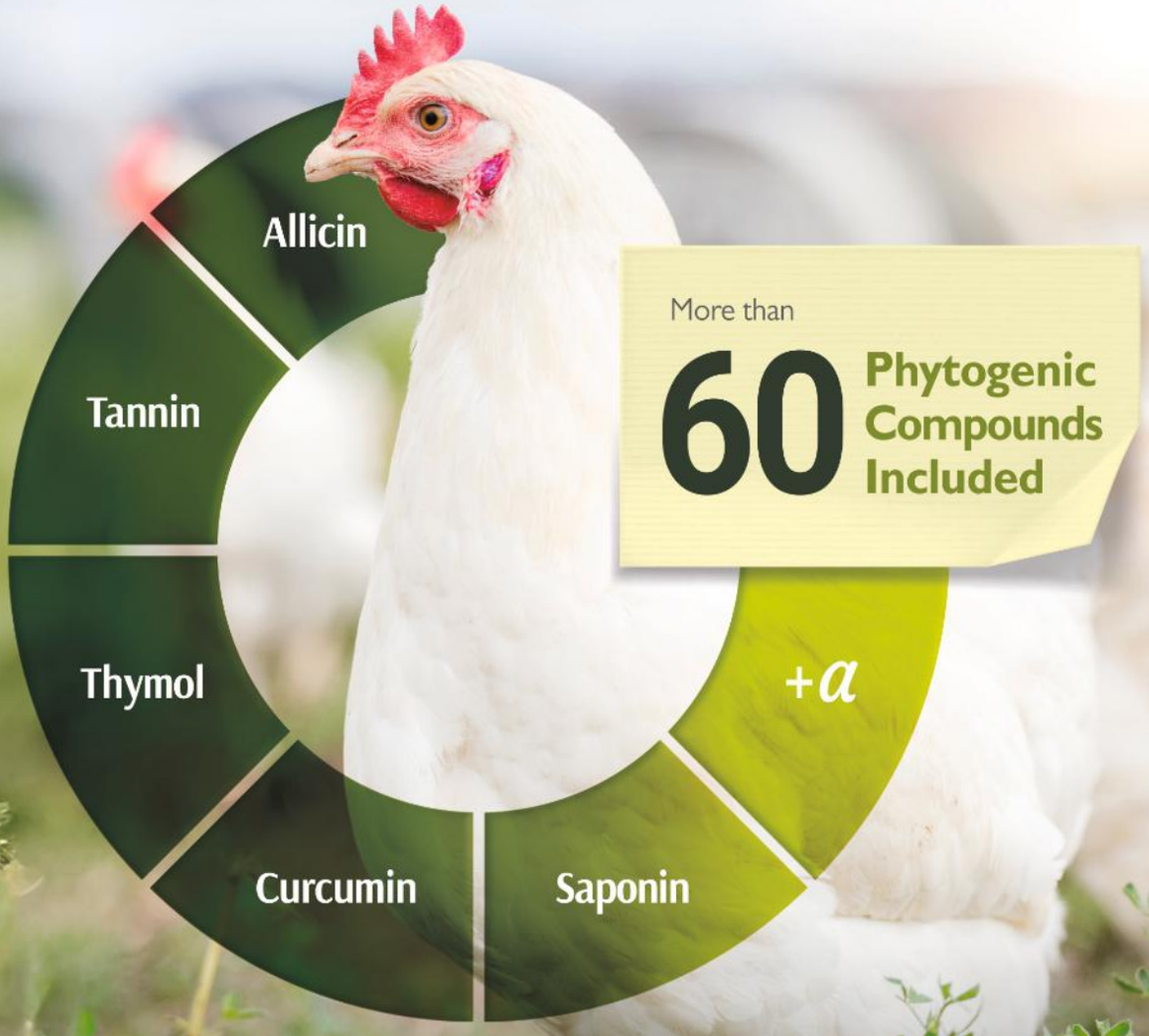

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क्लोएसाइटिस या वैंट ग्लीट:- एक ऐसी बीमारी है जो अंडे वाली मुर्गियों में AI Tips को ठीक से उपयोग न करने के कारण सभी फार्मों पर अक्सर देखने को मिलती है। क्लोएका वह प्वांइट है जहां से अंडा बाहर निकलता है। मरी हुई मुर्गियों में इसी प्वांइट पर लाल, जख्म या सूजन मिलता है।

लैब में सैंपल लेने पर E-coli, स्टैफ और फंगस का संक्रमण पाया जाता है।

मेरे प्यारे फार्मर भाईयो, अगर आप 20 मरी हुई अंडे वाली मुर्गियों को चैक करोगे तो ज्यादातर मुर्गियां इसी कारण से मरी पाई जाएगी।

कारण:—

(1) एक ही Tip से ज्यादा मुर्गियों में टीका करना।

(2) AI Tips को सही तरीके से सफाई न करना।

(3) AI Tip की क्वालिटी का उपयुक्त न होना।

(4) AI Tips का AI करते समय हाथों से संक्रमित होना।

उपाय:—

(1) संक्रमित मुर्गी को AI करते समय अलग करें।

(2) Lorexane cream/spray संक्रमित स्थान पर ठीक तरीके से लगाएं।

(3) AI करने से पहले हाथों को Dettol साबुन से धोएं।

(4) एक Tip से एक ही मुर्गी की AI करें।

बचाव:—

(1) AI Tips की Proper सफाई करें।

(2) AI Tips को पानी / dil. HCL से साफ करके ठीक तरीके से Autoclave करें!

(3) Autoclave के पश्चात AI Tips को Hot Air Oven में सुखाएं।

(4) AI Tip को प्रयोग करने से पहले हाथों को Dettol साबुन से अच्छी तरह साफ करें।

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IRIS Life Solutions Bolsters Global Ambitions with the

Appointment of

Dr. Bhupendra Sharma as Executive Vice President

In a move that signals a bold new chapter in its quest to become a global animal health powerhouse, **IRIS Life Solutions Private Limited** is proud to announce the appointment of Dr Bhupendra Sharma as **Executive Vice President**. A seasoned veteran with over 16 years of transformative experience in the South Asian poultry and livestock industry, Dr Sharma joins IRIS to spearhead the group's aggressive commercial expansion and technical innovation.

Dr Sharma brings an unparalleled blend of scientific rigour and strategic business acumen to the group. He holds a **B.V.Sc& A.H.** from Kerala Agricultural University, an **MBA** in Marketing from PTU, an **Executive MBA** from the prestigious UCD Michael Smurfit Graduate Business School in Dublin (Ireland) and an **Honorary Doctorate** in animal nutrition research and development. His career is defined by high-impact leadership roles at global giants, where he consistently delivered double-digit growth and transitioned businesses toward value-driven models.

A Strategic Vision for a Global Powerhouse

IRIS Life Solutions is currently executing a definitive five-year roadmap to scale into a **global animal health powerhouse.** The group is rapidly expanding its footprint to establish commercial operations in 30 countries within the next 36 months. As Executive Vice President, Dr Sharma's expertise in animal health, nutrition and market development will be pivotal in aligning these ambitious goals with science-backed solutions for producers worldwide.

A Message from the CEO

Tamil Alanzo Elangovan, CEO of IRIS Life Solutions, expressed deep optimism regarding this new leadership appointment:

"We are delighted to welcome Dr Bhupendra Sharma to the IRIS family as our Executive Vice President. His appointment is not just an 'onboarding'—it is a convergence of shared values and relentless ambition.

Dr Bhupendra's approach aligns perfectly with the belief that **'Success is the sum of small efforts, repeated day in and day out'** — a philosophy that mirrors the very DNA of IRIS.

As we build the future of animal health in India and beyond, we need leaders who don't just see the industry as it is, but as it *should* be. With Dr Bhupendra's extraordinary track record in leadership and strategy, I am confident that our journey toward becoming a global powerhouse is now on an accelerated trajectory. We are committed to a long-term partnership that empowers our team, serves our farmers, and sets new benchmarks in the global animal health landscape."

Dr Bhupendra Sharma stated: I am excited, humbled and honored to be a part of the IRIS Family. As a member associated with this prestigious group i am committed to serve our industry with best of my capabilities as i always believe that **"Certain Energies comes only when you burn"**, I look forward to long-term partnership that empowers and strengthens our team for the stronger future growth and influence industry outcome by collaborative strategic thinking and planning . At IRIS we deliver the results with a strong focus on research , value driven solutions and technical excellence at its best so that we can enhance the business productivity for our farmer community and animal industry.

About IRIS Life Solutions

Headquartered in Bengaluru, **IRIS Life Solutions** is a leader in animal health pharmaceuticals and nutraceuticals. Built on the legacy of the late **Dr Elangovan**, a pioneer in the field, the company is dedicated to excellence in manufacturing and digital transformation. Through its cutting-edge facilities and commitment to international quality standards, IRIS continues to innovate for the poultry, livestock, and companion animal sectors.

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Julien Kanarek to Guide Enzyme Growth

Julien Kanarek joined NOVUS in January as the company's feed enzymes global lead. He brings nearly 20 years of experience in animal nutrition, biotechnologies, and feed additive market strategizing to the leader in intelligent nutrition.

Kanarek joins the company during a time of growth and innovation for its enzymes portfolio. Recently, NOVUS purchased BioResource International, Inc. (BRI), to gain full control of its CIBENZA® Enzyme Feed Additive product line and began a development partnership with Ginkgo Bioworks. Teams also hosted educational workshops for customers on the hidden risk in soybean meal (an anti-nutritional factor known as trypsin inhibitor). Last month, the company shared a new white paper, *Outsmarting Trypsin Inhibitors*, available now to download.

Kanarek says NOVUS is right by increasing its focus on enzymes. With feed costs as one of the highest budget lines for pig and poultry producers, ongoing economic shifts, and constraints when it comes to raw material options, strategic decisions must be made. Kanarek said one well-known applied strategy to get more from feed ingredients is enzyme technology.

"What I find exciting is that enzymes have not shown us their full potential yet. The world of anti-nutritional factors also hasn't been fully defined and explored," he says. "NOVUS has been studying these aspects for over a decade but in the last year we're seeing an acceleration in interest from the academic community. So, we have 10 years of enzymes and trypsin inhibitor research that helped us to build a solid database of soybean profiles from around the world. Now we will also look at leveraging what researchers who have taken an interest in this subject are finding and add that knowledge to our own understanding."

Kanarek says NOVUS is committed to putting all the pieces together to create services and solutions that support the customer.

"There is no one single enzyme that can solve every problem," he says. "It has to be the right cocktail of biotechnologies with an adapted application. For that, we need to understand our customers' context and challenges so we can build robust, reliable and sustainable solutions for them."

Laura Munoz, senior director of Global Strategic Marketing at NOVUS, says Kanarek's leadership will be key as NOVUS continues to strengthen its enzyme business.

"Through acquisitions and innovation projects, NOVUS has taken big steps to demonstrate our commitment to the feed enzymes sector. Julien's global perspectives on the current market and strategic concepts on how the animal agriculture industry will use enzymes in the future will help us build a portfolio of solutions and services for today and tomorrow."

Prior to joining NOVUS, Kanarek served as Marketing Manager - Poultry and Regional Category Manager for Europe at Adisseo; Global Business Segment Leader - Poultry at Danisco Animal Nutrition and Health, part of International Flavors & Fragrances (IFF); and Global Category Manager at Avril. He has master's degrees in animal nutrition and health from UniLaSalle in France with a specialization in comparative animal nutrition from University of California-Davis in the United States.

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Oxidative Stress in Indian Poultry

Evaluating the Efficacy of Natural Vitamin C -Based Phytogenic Supplementation of VAM-C

Author- Dr Manish Mukherjee

Abstract

India's poultry industry operates under persistent environmental, physiological, and pathogenic stress conditions that significantly impact bird health and productivity. Oxidative stress, a key consequence of these stressors, leads to impaired immunity, poor feed conversion, and reduced production performance. Conventional supplementation with synthetic Vitamin C is limited by low thermostability and restricted biological activity. This paper evaluates the role of natural Vitamin C (VAM-C) derived from Phyllanthus emblica (Amla), combined with Ashwagandha, Selenium, and Garlic, as a superior alternative. Evidence suggests enhanced antioxidant capacity, improved bioavailability, and measurable economic benefits in commercial poultry production systems.

Introduction

The Indian poultry sector is among the largest globally, contributing significantly to protein supply through egg and meat production. However, intensive production systems expose birds to continuous stressors such as high ambient temperatures, vaccination schedules, transportation, and disease challenges. These stressors disrupt physiological homeostasis and increase oxidative stress levels.

Oxidative stress results from an imbalance between reactive oxygen species (ROS) generation and antioxidant defense mechanisms. In poultry, endogenous synthesis of Vitamin C becomes insufficient during stress, necessitating external supplementation. While synthetic ascorbic acid has been widely used, its limitations necessitate exploration of more effective alternatives.

Oxidative Stress in Poultry: Mechanisms and Impact Physiological Basis

Reactive oxygen species, including superoxide radicals, hydrogen peroxide, and hydroxyl radicals, are natural by-products of metabolism. Under stress conditions, excessive ROS production overwhelms antioxidant systems such as superoxide dismutase, catalase, and glutathione peroxidase.

This leads to:

- Lipid peroxidation
- Protein denaturation
- DNA damage

Production Implications

The biological consequences of oxidative stress in poultry include:

- Reduced growth rate and feed efficiency
- Impaired immune response
- Decline in egg production and shell quality
- Increased mortality rates

Indian Production Scenario

India's climatic diversity intensifies oxidative stress:

- High temperatures and humidity in southern and western regions
- Seasonal fluctuations in northern regions Mycotoxin challenges in eastern regions
- These factors collectively contribute to suboptimal productivity compared to global benchmarks.

Limitations of Synthetic Vitamin C Supplementation

Synthetic ascorbic acid supplementation presents several constraints:

- **Thermal degradation** during feed pelleting (up to 50% loss)
- **Limited activity** in aqueous environments only
- **Rapid metabolism and excretion**
- **Absence of synergistic compounds**

These limitations reduce its effectiveness under commercial farming conditions.

VAM-C as a Phytogenic Alternative Source and Composition

VAM-C is derived from Phyllanthus emblica (Amla) contains:

- Ascorbic acid
- Bioflavonoids
- Polyphenols
- Tannins (emblicanin A & B)

This complex matrix enhances antioxidant stability and activity.

Mechanism of Action

VAM-C provides:

- Dual-phase antioxidant protection (aqueous and lipidphases)
- Cell membrane stabilization
- Enhanced collagen synthesis
- Immune system support

Thermostability and Bioavailability

Cold-extracted natural Vitamin C retains activity during feed processing and storage,ensuring effective delivery to the bird.


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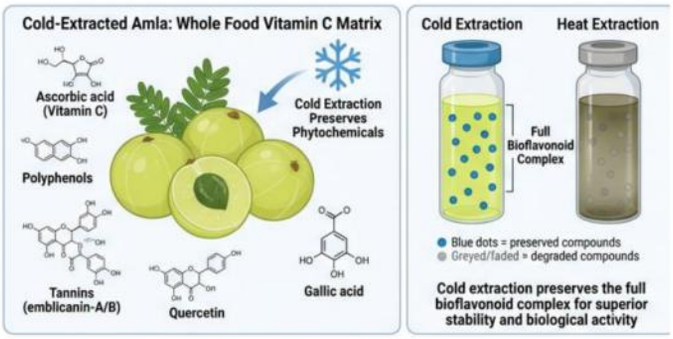


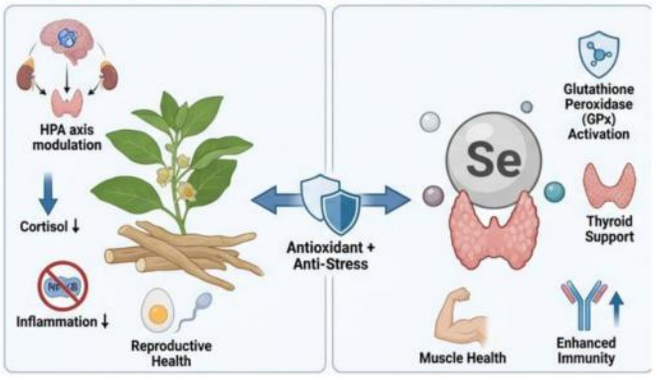
Ashwagandha (Withania somnifera)

Ashwagandha functions as an adaptogen, regulating stress responses through the

hypothalamic-pituitary-adrenal axis.

Key benefits:

- Reduction in cortisol levels
- Anti-inflammatory effects
- Improved reproductive performance



Selenium is a critical component of antioxidant enzymes.

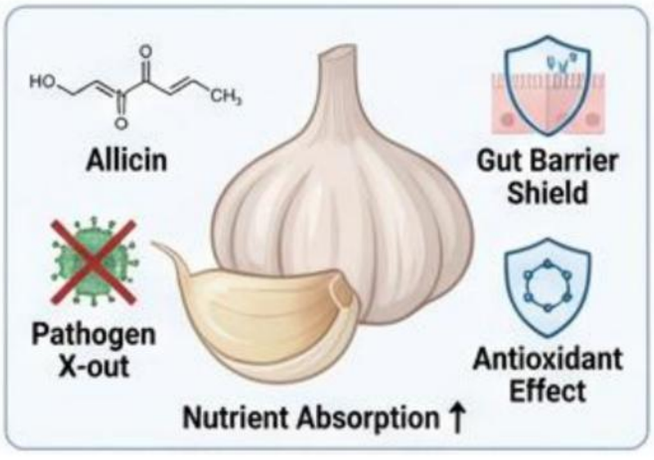
Functions include:

- Activation of glutathione peroxidase
- Enhancement of immune response
- Support of thyroid metabolism

Garlic (Allium sativum)

Garlic contributes to:

- Antimicrobial activity
- Gut microbiota modulation
- Improved nutrient absorption



Comparative Evaluation: VAM-C vs Synthetic Vitamin C

Parameter	VAM C	Synthetic Vitamin C
Antioxidant Activity	High (~6×)	Moderate
Stability	Thermostable	Heat-sensitive
Phase Protection	Aqueous + Lipid	Aqueous only
Bioavailability	High	Moderate
Additional Benefits	Adaptogenic & enzymatic support	None

Economic and Production Benefits

Feed Conversion Efficiency

VAM- C supplementation improves feed conversion ratio (FCR) by approximately 0.05-0.10

points under stress conditions, resulting in significant feed cost savings.

Egg Production

In layers, supplementation mitigates heat stress effects and can recover 3-5% egg production

losses.

Mortality and Health Costs

Improved antioxidant and immune status reduces:

- Disease incidence
- Mortality rates
- Veterinary intervention costs

Return on Investment

Considering improved productivity and reduced losses, natural Vitamin C supplementation delivers an estimated ROI of 5:1 to 10:1.

Practical Applications

VAM-C is recommended in:

- Heat stress conditions
- Vaccination programs
- Transportation and handling stress
- High stocking density environments
- Disease recovery phases
- Mycotoxin exposure scenarios

Conclusion

Oxidative stress remains a major limiting factor in poultry productivity under Indian conditions. Synthetic Vitamin C supplementation, while widely used, is constrained by instability and limited biological activity.

VAM- C derived from Amla, combined with adaptogenic and antioxidant co-factors such as Ashwagandha, Selenium, and Garlic, offers a comprehensive and effective solution. Its superior stability, bioavailability, and multi-functional benefits translate into improved performance, enhanced immunity, and better economic returns.

Adopting phytogenic antioxidant strategies represents a scientifically sound and commercially viable approach for sustainable poultry production.

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ARTICLE

Factor Influencing Fat Digestion With Potential Solution In Poultry During Summer: A Review

Dr. Bharat Sadarao, Dr. Partha Das, Dr. Venket Shelke, and Dr. R. Chanthirasekaran

Introduction

In the context of poultry production, commercial avian species face heightened susceptibility to heat stress due to physiological characteristics and environmental factors associated with their intensive growth and production rates. The growing demand for poultry meat and eggs has driven the selection of birds that grow quickly and produce more, resulting in strains particularly vulnerable because of their increased metabolic activity and heat generation. This selective breeding has improved economic traits, leading to enhanced body weight gain, efficiency, and breast yield, but has also resulted in undesirable fat accumulation, which is economically wasteful and affects consumer perception.

In poultry, excessive fat can impair reproductive performance, prompting investigations into dietary strategies to regulate lipid metabolism and decrease abdominal fat. With the rising costs of conventional feed ingredients like maize and soybean, researchers have turned to alternative feeds such as agro-industrial by-products, specifically broken rice, which is economically viable and provides comparable protein and energy content. The use of broken rice has shown similar energy efficiency in poultry diets but poses challenges due to its high oil content, risking oxidative rancidity in hot climates.

Studies have indicated that substituting maize with alternative sources like broken rice can lead to increased fat accumulation in poultry, contributing to issues like fatty liver-hemorrhagic syndrome (FLHS) and sudden mortality. Additionally, the unique digestibility characteristics of rice, combined with heat stress effects, exacerbate fatty tissue proportions within poultry. Therefore, this revision aims to educate poultry owners about factors influencing abdominal fat deposition and propose potential solutions for managing these issues, especially during the summer months.

Mechanism of Fat Distribution

In avian species, the majority of fat synthesis, almost 90%, occurs in the liver, with adipose tissues primarily serving as fat storage. In species such as commercial poultry, especially when dietary fat intake is low, the liver's role in fatty acid production becomes even more critical. Once formed, fatty acids are transformed into triacylglycerol (TG) and packaged into very low-density lipoprotein (VLDL) for distribution to tissues for immediate energy use or storage. An increase in liver fat synthesis results in heightened transportation of triacylglycerol to adipose tissues via VLDL. However, insufficient VLDL production to manage the liver's TG output can cause lipid buildup and hepatic steatosis. Birds lack a well-developed lymphatic system, so fat absorption occurs directly in the gastrointestinal tract, with lipids transported to the liver as portomicrons through the hepatic portal system. This unique physiology means that well-fed avian species, notably commercial poultry, are more prone to liver fat deposition. The accumulation of body fat in birds is influenced by the availability of plasma lipid substrates sourced from the diet or synthesized in the liver. Consequently, the lipid sources in poultry diets significantly affect overall body fat distribution.

Effect of Summer Stress on Fat Deposition

Modern broiler chickens have undergone significant artificial selection for traits such as rapid growth and feed efficiency, leading to weights that are over four times heavier than those of broilers from 1957 by the shipping age of 56 days. High ambient temperatures minimize energy expenditure for thermoregulation, resulting in excess energy being stored as ectopic fat, which is utilized for thermogenesis at lower temperatures. Chronic heat stress alters the fatty acid profile in tissues, increasing saturated fatty acids and causing a rise in overall fatness while reducing unsaturated fatty acids. Studies indicated that chronic heat exposure negatively affects muscle composition, notably decreasing breast muscle proportion while increasing thigh muscle. Interestingly, even with reduced feed intake, fat deposition in poultry can escalate due to heat stress; broilers maintained at 34°C retained 25% more dietary energy as body fat compared to those in thermoneutral conditions (22°C). Heat stress explicitly enhances abdominal fat deposition, as shown by a ~20% increase in adiposity after just a week of exposure. Prolonged exposure to heat can lead to an 80% increase in abdominal fat after three weeks. Concurrently, heat-exposed broilers display alterations in hormone levels, with lower plasma triiodothyronine and elevated corticosterone, which may drive further fat.

Additionally, environmental factors contribute to conditions like fatty liver-haemorrhagic syndrome (FLHS), which is more prevalent in summer; high temperatures increase lipid accumulation in laying hens. Data from farms indicate that mortality rates are significantly influenced by extreme summer climate changes, particularly in older chickens (over 27 days) during critical fattening periods. Previous studies report elevated mortality linked to FLHS under higher ambient temperatures, underscoring the essential role of environmental heat in these adverse outcomes.

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Role of Emulsifiers on Fat Mobilization

The digestion of fats presents significant challenges because fats are not water-soluble, yet the process occurs in an aqueous environment within the small intestine. Emulsifiers, particularly bile salts, and the enzyme lipase play crucial roles in fat digestion by facilitating emulsification, which is influenced by factors such as the chain length of fatty acids, their placement on triglycerides, and saturation levels. However, certain factors can hinder the effectiveness of these natural emulsifiers, notably in young birds, where limitations in bile salt and lipase production restrict fat digestion until their gastrointestinal tracts mature. This immaturity prevents the formation of mixed micelles essential for effective fat breakdown and nutrient absorption.

Additionally, epithelial damage and inflammation can compromise the intestinal barrier, leading to increased pathogen entry, heightened inflammatory responses, and impaired nutrient absorption—particularly affecting fat and fat-soluble vitamins more than macronutrients like carbohydrates or proteins. Non-starch polysaccharides (NSPs), being indigestible carbohydrates, contribute to increased gut viscosity, enclosing nutrients and fostering the growth of anaerobic bacteria, which adversely affect fat digestion by deconjugating bile acids, leading to increased excretion of bile.

This situation has sparked interest in exogenous emulsifier preparations to enhance fat utilization. These emulsifiers can assist bile salts in both emulsion and micelle formation, positively impacting lipid digestibility and performance. Emulsifiers can lower surface tension, promote micelle formation, and facilitate nutrient transport across intestinal membranes. They can be classified into natural emulsifiers (e.g., bile and phospholipids, and those from food materials such as soy lecithin) and synthetic ones (e.g., modified emulsifiers like lysolecithin or lysophosphatidylcholine blends of hydrolyzed lecithin, glycerol polyethylene glycol ricinolate).

The selection of emulsifiers often relies on their hydrophilic-lipophilic balance (HLB), which indicates their solubility characteristics; lower HLB values correlate with more lipophilic properties, while higher values indicate increased hydrophilicity. Research suggests that combining suitable emulsifiers can enhance stability better than using individual emulsifiers.

Challenges with Current Molecules and Solutions

Dietary supplementation of bile salts has been shown to enhance lipid utilization in chickens; however, its commercial application is limited due to economic constraints. Lecithin, being a more lipophilic emulsifier, is considered unsuitable for poultry because of its structure, which comprises two lipophilic tails and one hydrophilic head. Despite improvements in fat digestion attributed to bile salt supplementation, it remains economically unfeasible as a feed additive. In chickens, the gut functions as an oil-in-water emulsion system, necessitating high HLB emulsifiers, since birds consume approximately double the amount of water compared to feed. Research indicates that the addition of polyethylene glycol (PEG)-based emulsifiers may inadvertently lead to the inhibition of lipase activity due to steric hindrance in emulsified components. Moreover, safety concerns arise from the potential formation of 1,4-dioxane, a carcinogenic compound produced during the synthesis of PEG-based emulsifiers, compelling the cosmetic industry to explore alternatives that do not involve PEG.

To fully harness the growth potential of broilers, cost-effective exogenous emulsifiers are being explored, with lysophospholipids (LPL) emerging as a promising candidate. LPLs sustain superior emulsifying properties compared to bile salts and soy lecithin due to the removal of one hydrophobic tail, resulting in greater stability within the gastrointestinal tract's aqueous environment. They exhibit a higher hydrophilic-lipophilic balance and better oil-water emulsification capability than standard phospholipids and have a lower critical micelle concentration, facilitating smaller micelle formation. The efficacy of LPLs as emulsifiers is contingent on the appropriate ratio of lecithin to lysolecithin, typically maintained within an HLB range of 8 to 16.

Additionally, novel compounds like polyglycerol derivatives of fatty acid esters have been assessed, demonstrating improved surfactant properties compared to polyethylene-based emulsifiers due to the presence of secondary hydroxyl groups in their glycerol components. Metabolic studies indicate that these polyglycerol esters undergo hydrolysis in the gastrointestinal tract, with the fatty acid moieties metabolizing normally. A two-year dietary study on these esters confirmed their non-carcinogenic nature and the absence of adverse effects at concentrations up to 5%.

Kemin Solution for Fat Management

The published results of the above-mentioned solutions led to the hypothesis that polyglyceryl emulsifiers of fatty acids at optimal amounts in the LYSOFORTE® formulation could be an ideal nutritional emulsifier to improve lipid emulsification and hydrolysis, thereby maximizing Lysoforte's nutrient absorption capacity. To our knowledge, polyglycerol fatty acid esters have never been evaluated before as a nutritional emulsifier in the feed industry. LYSOFORTE®, which utilizes lysolecithin (HLB 8 - 11), has been shown to increase fat digestibility by facilitating the formation of small oil-in-water micelles in the intestines of animals. Additionally, lysolecithin is known to promote collagen expression and villus length in the jejunum of broiler chickens (Brautigan et al., 2017). Recently, a new version of LYSOFORTE®, namely LYSOFORTE® Extend Dry, containing a specific ratio of lysophospholipids, monoglycerides, and synthetic emulsifiers, was patented by Kemin Europa, claiming to maximize nutrient absorption by lysolecithin.

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LYSOFORTE® Dry functions as a natural biosurfactant consisting of a patented molecular blend of various lysophospholipids, enhancing fat digestibility and absorption, with its effectiveness supported by several farm trials on broilers. Alternatively, LYSOFORTE® Extend Dry blends lysophospholipids, monoglycerides, and synthetic emulsifiers, theorized to work synergistically, improving fat and nutrient absorption in avian species. Furthermore, since birds consume approximately twice the amount of water compared to feed, their gastrointestinal tract operates as an oil-in-water emulsion system where high HLB emulsifiers are advantageous. This aligns with Bancroft's principle (1912), which posits that emulsifiers should be soluble in the continuous phase to reduce interfacial tension and enhance micelle formation. Therefore, it is expected that high HLB emulsifiers would further enhance fat absorption in the gut. Therefore, along with LYSOFORTE® EXTEND, Kemin came out with a new molecule with a new molecule, LYSOFORTE®2.0, with a synergistic combination of lysophospholipids, polyglycerides, and synthetic emulsifier in an ideal HLB ratio for best efficiency in all stages of fat digestion and nutrient absorption.

LYSOFORTE®

Composition:

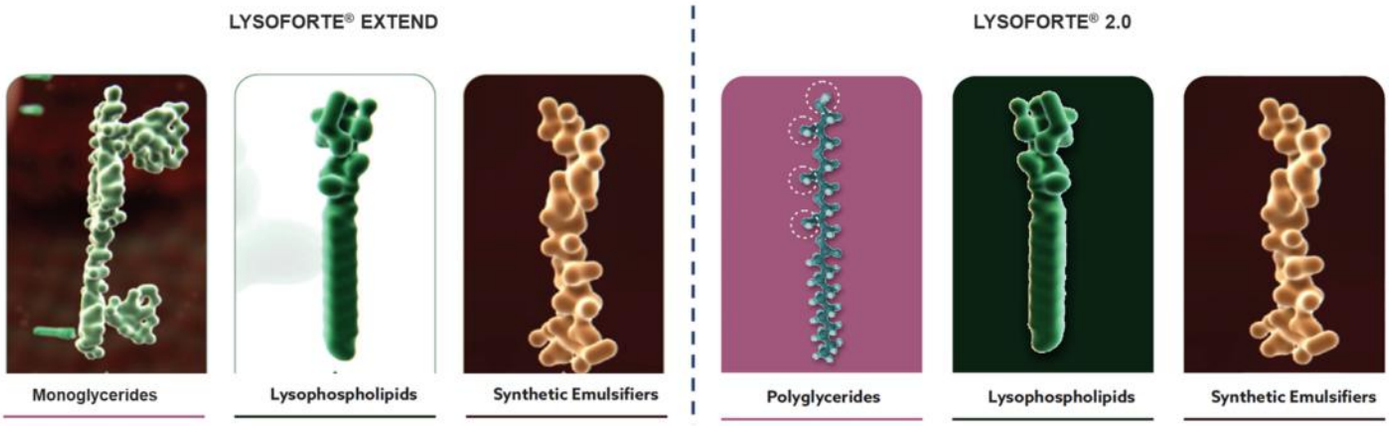

Figure 1: LYSOFORTE® variants composition for the market need.

Fat Digestion and Absorption Process:

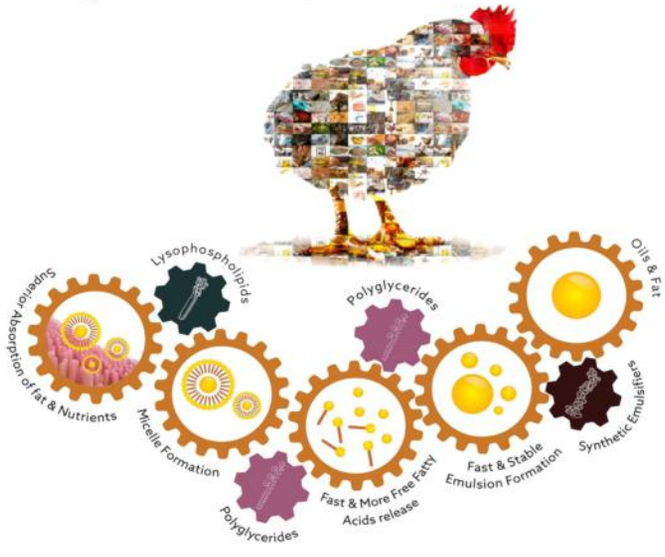

Figure 2: LYSOFORTE® process in fat digestion and nutrient absorption.

Mode of Action_Emulsification:

LYSOFORTE® helps to improve each step of the fat digestion process. When animals consume food that contains LYSOFORTE®, the biosurfactant molecules and bile salts in the stomach create a stable oil-in-water emulsion (Figure 4), which emulsifies lipids and creates smaller fat droplets in the intestine.

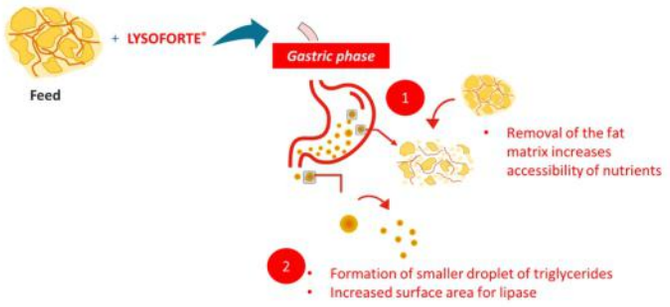

Figure 3: LYSOFORTE®: Emulsification.

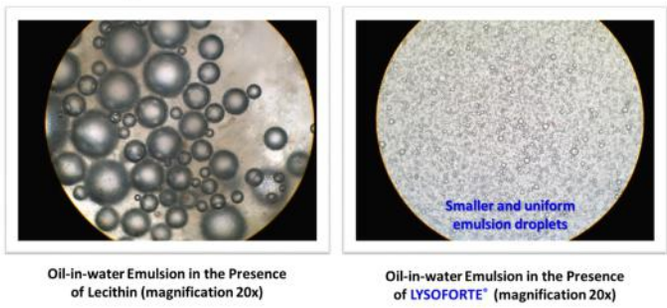

Figure 4: LYSOFORTE®: Emulsification *in vitro*.

Mode of Action_Lipid Hydrolysis:

LYSOFORTE® emulsions feature smaller fat droplets. Together, these tiny droplets give lipases a greater surface area to interact with the molecules, facilitating the more effective breakdown of fatty acids in the intestinal liquid phase.

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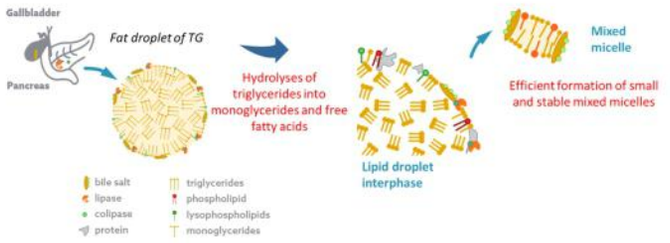

Figure 5: LYSOFORTE®: Lipid hydrolysis process in the small intestine.

Mode of Action_Nutrient Absorption:

Following hydrolysis, fatty acids aggregate to form micelles. LYSOFORTE® lowers the critical micelle concentration, which supports the formation of smaller and more stable micelles. This helps improve the absorption of fats, oils, and fat-soluble nutrients by the intestine, and has the best efficiency in all stages of fat digestion and absorption of nutrients.

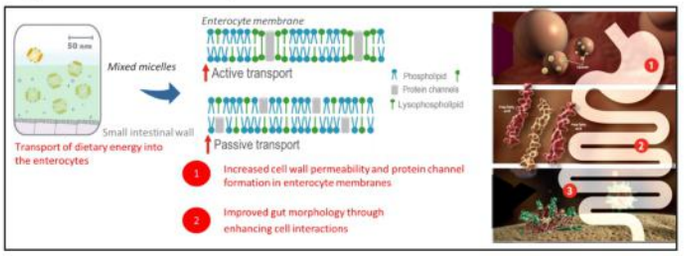

Figure 6: LYSOFORTE®: Nutrient absorption process in the small intestine.

Mode of Action_Gut Integrity:

The intestinal villi are covered with a single layer of absorptive and secretory cells in mammals. The more prominent collagen fibrils in the villi that we observed correspond to the lengthening of the villi. LYSOFORTE® significantly increases the villi collagen fibers and the villi length in the Jejunum. Longer villi would provide an improved absorptive area for the uptake of nutrients. An increase in tensile strength of the villi through increased deposition of collagen fibrils would enhance the overall structural health of the intestine.

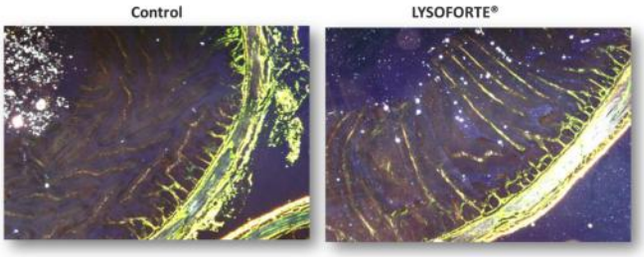

Figure 7: LYSOFORTE®: Collagen synthesis and Villi length.

Mode of action assists and promotes the absorption:

LYSOFORTE® plays an important role in promoting more efficient utilisation of feed. It facilitates the absorption of nutrients after enzymatic breakdown in the performance of several different species, including broilers, piglets, and fish. Its main mode of action is to assist and promote the absorption of nutrients that have been broken down by enzymatic digestion. LYSOFORTE® may act synergistically with other feed supplements, such as enzymes, which will improve nutrient breakdown in the gastrointestinal tract, but which will not necessarily influence absorption.

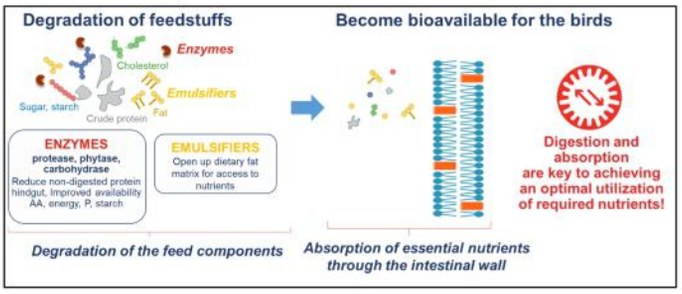

Figure 8: LYSOFORTE®: Synergism with enzymes for better absorption.

Conclusion

In summary, poultry production is significantly affected by thermal stress, particularly under high ambient temperatures and humidity, which adversely affect bird performance and fat utilization. Mortality rates are notably higher during the summer, especially towards the end of the fattening period, indicating an urgent need for effective monitoring and regulation of microclimates in housing through modern technology systems. Moreover, the efficiency of glucose absorption is linked to fat deposition in the liver, and the impact of various starch sources on fat deposition in poultry warrants further investigation. Existing research has predominantly focused on natural emulsifiers; however, both natural and synthetic emulsifying agents should be explored to enhance optimal emulsification in diets. LYSOFORTE, a natural biosurfactant, enhances feed utilization by promoting better and faster emulsification, fat hydrolysis, and overall nutrient absorption and can work synergistically with other supplements, or even without added dietary fat. Additionally, it may further reduce fat deposition from oil components in feed or partially substitute for excess starch to reduce body fat deposition in hot & humid climates. Additionally, exogenous emulsifiers can lower feed costs by partially replacing expensive fats, emphasizing their economic potential in the poultry industry through improved digestion of animal and vegetable fats.

References are available upon request.

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In our journey we visited many faces with our poultry Sector legends, and one among them is

Dr PK Shukla

Prof and Head Poultry Science and the Director, Institute of Para Veterinary Science DUVASU Mathura

1. Are you originally from Mathura?

No, I am not originally from Mathura. I am from Chhindwara District of Madhya Pradesh. My academic journey started from **Veterinary College, Jabalpur**, where I completed my graduation in Veterinary Science. Over the years, through my professional engagements in teaching, research, and policy formulation, I became closely associated with **U. P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwa Vidyalaya (DUVASU), Mathura**. Mathura eventually became the centre of my academic and administrative career, where I had the opportunity to serve as **Professor and Head of Poultry Science**, and also in important administrative roles such as **Dean, Dean PGS, and Registrar**. Hence, while I may not be originally from Mathura, the city has been an integral part of my professional life.

2. What is the best thing you liked in your journey?

The most fulfilling aspect of my journey has been the **opportunity to contribute simultaneously to research, education, and national policy in the poultry sector**. Working with students, guiding more than **32 postgraduate scholars**, and seeing them grow into professionals in academia and industry has been extremely satisfying.

Another rewarding experience has been my involvement in **national poultry development and disease monitoring initiatives** while serving as **Joint Commissioner (Poultry) in the Government of India**.

Being able to bridge the gap between **scientific research and policy implementation** and witnessing the growth of the Indian poultry sector over the decades has been one of the most gratifying parts of my career.

3. Why did you choose the poultry profession?

My decision to specialize in poultry science emerged during my graduate training, when I realized that the **poultry sector has immense potential to address nutritional security, rural livelihoods, and affordable protein supply in India.**

Poultry is one of the **fastest-growing segments of animal agriculture**, and it combines elements of **science, management, economics, and public health**. I found it intellectually stimulating because it allows a scientist to work on diverse issues—from **nutrition and disease control to production efficiency and policy development**. Over time, I developed a deep interest in contributing to this sector through **research, education, and institutional development.**

4. As compared to other big players in the poultry industry, how do you feel your presence is different?

The poultry industry has many outstanding entrepreneurs and industry leaders who have significantly contributed to production and commercialization. My role has been somewhat different because my contributions have largely been in the **domains of research, education, and policy support.**

Through my work in **academia, government policy, and national scientific institutions**, I have tried to strengthen the **scientific and institutional foundation of the poultry sector**. My focus has been on **capacity building, scientific research, disease monitoring systems, and policy advocacy**, which complement the efforts of industry leaders. I believe the growth of the poultry sector requires a **strong partnership between academia, industry, and government**, and I have tried to work at that interface.

5. Please tell us about your family.

I come from a family that has always valued **education, discipline, and social responsibility**. Their support and encouragement have been an important source of strength throughout my academic and professional journey. While my career has been quite demanding—spanning research, teaching, and administrative responsibilities—my family has always provided the balance and motivation needed to pursue my goals. Their understanding and encouragement have played a significant role in whatever achievements I have been able to accomplish.

6. What is your dream for the next generation entering this business?

My dream for the next generation entering the poultry sector is that they should look at this field not merely as a business, but as a **scientifically driven, technology-oriented and socially important enterprise**. Poultry farming today is no longer a traditional activity; it has evolved into a **highly organized agro-industry** that integrates genetics, nutrition, disease management, processing, and global trade.

I would like young professionals to focus on **innovation, sustainability, and biosecurity**. Issues such as **climate resilience, efficient feed utilization, disease surveillance, and value addition** will shape the future of this sector. At the same time, the poultry industry has a crucial role in ensuring **nutritional security by providing affordable animal protein** to millions of people.

Therefore, my message to the next generation is to combine **scientific knowledge, entrepreneurship, and ethical responsibility** so that the poultry sector continues to grow while remaining sustainable and resilient.

7. What is your favourite eatery food?

UnLike most people associated with the poultry sector, I appreciate **simple and nutritious Vegetarian food**. I particularly enjoy **well-prepared Vegetarian dishes**, especially traditional Indian preparations that balance taste and nutrition.

8. What are your hobbies?

Despite a busy professional schedule over the years, I have always tried to maintain a few personal interests. **Reading scientific literature and books related to agriculture, policy, and education and writing Scientific articles** have been one of my long-standing interests apart Horse Riding, Playing Badminton participating in roundtables, delivering lead papers in scientific forum etc.

I also enjoy **interacting with students and young professionals**, discussing emerging trends in animal agriculture and poultry science. In addition, spending time in **academic discussions, writing, and mentoring young scholars** has been both a professional responsibility and a personal passion.

Whenever time permits, I also appreciate **travelling for academic interactions and conferences**, as it provides opportunities to exchange ideas and learn from diverse experiences.

9. Anything you would like to add?

I would like to emphasize that the **Indian poultry sector has emerged as one of the most dynamic and resilient segments of animal agriculture**. Over the past few decades, it has demonstrated remarkable growth despite challenges such as **feed cost fluctuations, disease threats, climate variability, and market uncertainties**. This progress has been possible because of the collective efforts of **farmers, entrepreneurs, scientists, veterinarians, policymakers, and industry stakeholders**.

Looking ahead, the sector must continue to focus on **scientific management, strong biosecurity, sustainable production practices, and value-chain integration**. Greater investment in **research, innovation, disease surveillance, and skill development** will be essential to maintain competitiveness both domestically and globally.

I would also like to stress the importance of **collaboration between academia, industry, and government institutions**. Such partnerships can accelerate the adoption of new technologies, improve productivity, and ensure that poultry production remains **economically viable, environmentally responsible, and nutritionally relevant** for the country.

Finally, I believe that the poultry sector has a crucial role in **strengthening India's food and nutritional security**, and it will continue to offer tremendous opportunities for the younger generation of scientists, veterinarians, and entrepreneurs. With the right vision and commitment, the future of Indian poultry is indeed very promising.

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ARTICLE

Climate in Poultry Houses

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The **climate in poultry houses** influences the wellbeing and health of humans as well as the birds. Respiratory, digestive and behavioral disorders are more likely to occur in houses in which the climatic conditions are not up to standard. The efficiency with which feed is utilized is related to the health status of the flock. Animals that are not healthy cannot be expected to perform optimally. The younger the animals are or the higher their production level, the more sensitive they become to the climatic conditions in the house. Climate can be defined as the sum of environmental factors which influence the functioning of man and animal.

Climatic factors

The following factors must be measured at animal level.

- Temperature
- Relative humidity
- Air composition
- Air speed and air movement
- Light

Factors influencing climatic conditions and the birds' micro-climate

House climate can be influenced by insulation of roof, walls and floor, ventilation, heating, cooling and lighting. The climate directly surrounding the birds is called the micro-climate (for example, chickens in a brooding ring). In fact the micro-climate is the only thing that is of importance for the birds. It is possible that the climate in the house is acceptable but the climate at bird level is unsuitable. For example CO_2 is a heavy gas and CO_2 levels at bird level can be much higher than at 2 m height. Another example is the brooding ring. The use of brooding rings means that the temperature of the house can be lower as long as the temperature at chicken level (under the brooder) is correct. This principle is applied in order to save on heating expenses. The advantages should be weighed against the disadvantages i.e. with brooding rings you can save on energy but often the labour to make and manage the brooding rings is more.

Temperature

Layers are warm blooded (homoeothermic) i.e. within a certain range, their body temperature is quite constant. On average, the body temperature of birds is between 41°C and 42.2°C. Body temperature is kept quite constant and is regulated by part of the chicken brain (the hypophyge). This part of the brain is comparable to a thermostat. Contraction and widening of blood vessels and the speed of respiration influence heat emission and retention which consequently influence the body temperature. It takes some time before heat regulating mechanisms start functioning in newborn animals and therefore they need a higher ambient temperature than adult animals do. Furthermore, the ratio between the surface area and weight of young animals is unfavorable and they do not have any fat reserves.

Temperature zones

The comfort zone is defined as the temperature zone in which the birds are able to keep their body temperature constant with minimum effort. This temperature zone also depends on the feeding level and housing conditions. Behavior of birds will change when temperatures rise to above the comfort zone as they will start to pant and change their body position. When temperatures are below the comfort zone birds will also change their body position and huddle together.

The thermo neutral zone is defined as the temperature zone in which the birds are able to keep their body temperature constant with the help of physical heat regulation . This temperature zone depends on feeding level and housing conditions of the birds and other factors. The lowest temperature in the thermo neutral zone is called the **lowest critical temperature** (LCT). If temperatures fall to under this temperature the bird will start to use feed energy to warm itself (i.e. maintain its body temperature) and will consequently consume more feed. The highest temperature in the thermo neutral zone is called the **highest critical temperature** (HCT). If the temperature rises above this temperature the birds can no longer dissipate their heat. They will start to consume less feed and production will drop as a result.

The highest and lowest critical temperature depends very much on:

1. Age
2. Bodyweight
3. Housing system
4. Feeding level
5. Relative humidity
6. Air velocity
7. Health

Physical heat regulation

When temperatures are not within the comfort zone, birds have several mechanisms which enable them to keep their body temperature constant without having to produce extra heat. This is referred to as physical heat regulation and factors that influence physical heat regulation include:

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- **Tissue insulation** - if birds have a layer of subcutaneous fat, they can afford to let their skin temperature drop. Only if the animals are fed properly can they deposit a subcutaneous fat layer when temperature decreases.
- **Feathers** - feathers have an insulating effect and decrease the amount of heat that is lost to the environment.
- **Changing body position and huddling** - birds can effectively regulate heat loss through body position. Heat loss can be minimized by huddling close together. In hot weather, on the other hand, the birds increase their body surface as much as possible.
- **Vaporization of water** - if temperatures are high, or extremely high, sensible heat loss is minimized and almost all heat will have to be lost as insensible (latent) heat. Latent heat loss is the heat lost from the body through the elimination of respiratory moisture.
- **Flow of blood through skin and mucous membranes** - the flow of blood to the skin and mucous membranes can be controlled through the contraction and widening of blood vessels. The larger the flow of blood is, the more heat is lost.

Chemical heat regulation

Another way in which poultry can regulate their body temperature is chemical heat regulation. When the ambient temperature is not within the thermo neutral zone the birds can:

1. Increase feed intake when the temperature is below thermo neutral zone
2. Decrease feed intake when the temperature is above the thermo neutral zone.

Measuring and assessing temperature

The best instrument for measuring temperature is the animal itself. Assessing the temperature by observing the birds themselves should only be done when the animals are at rest, not when they are active or eating. Obvious indicators of unsatisfactory house climate are:

- Behavior of the animals
- Abnormal body position
- External abnormalities
- Abnormal plumage may point to mistakes in house climate
- Coughing/sneezing frequencies
- Activeness

Measuring the temperature is the most common way of assessing the climate in a house. Such a measurement can give a lot of useful information and is not expensive or hard to do. There are several ways of measuring the temperature:

1. Minimum/maximum thermometer (in every house or section of a house)
2. Temperature sensor (computerized climate control)
3. Thermometers (alcohol, electronic)
4. Infrared thermometers - electronic thermometers

Location of the thermometer

The temperature in a house is not uniform and therefore, there are several places where the sensor should not be placed (i.e. it should not be hung close to the wall or behind something which hinders the air flow) and should not be hung too high in the house. Furthermore, the location of the air inlet and heating equipment is important in determining the best position for the temperature sensor. It is best to place it as close to the animals as possible and in such a way that the fresh air passes the sensor before it reaches the animals.

Recommended temperatures for layers and broilers

The critical temperature for layers is 20°C. For every 1°C lower than 20°C, the birds require an extra 1.5 g of feed per day. The most efficient temperatures for layers are between 20 - 24°C. When temperatures rise above 24°C, shell quality and egg weight will reduce. The critical temperature for broilers and rearing birds is highly dependent on age.

The recommended house temperatures for poultry are given in the following table.

Table 1. Recommended temperatures for broilers and rearing

First day	32-34°C
1st week decrease	30°C
2nd week decrease	26°C
3rd week decrease	22°C
4th week decrease	20°C

Note: These temperatures are recommended temperatures and should be adapted to local situations as necessary.

Relative Humidity

The following concepts are used to measure the humidity of air in poultry houses:

- Absolute humidity = grams of moisture present in 1 m^3 of air.
- Maximum humidity = maximum grams of moisture that can be present in 1 m^3 of air at a given temperature.
- Relative humidity = the relationship between the moisture content of the air and the maximum moisture content at the current air temperature expressed in percentages.

Example of relative humidity %

If the air temperature is 10°C and contains 5.7 g of moisture, the relative humidity is 5.7/9.5 x 100 = 60%. (See the table 3 on absolute moisture content in g/m^3 of air for the moisture content in air with a temperature of 10°C). If the same air is heated without adding moisture until it reaches a temperature of 20°C, the relative humidity will be 5.7/17.5 x 100 = 33%. So it can be concluded that heating air results in lower relative humidity. Conversely, cooling the air will result in a higher relative humidity e.g. if the same air was 4°C the relative humidity would be 5.7/6.4 x 100 = 89%. This demonstrates that the warmer the air, the greater its capacity to contain moisture.

Measuring humidity

Relative humidity in poultry houses is measured to determine whether respiratory disorders are due to too high or too low relative humidity. If the relative humidity is too high, condensation can accumulate in the house. This has a direct effect on the growth of micro-organisms.

Measuring and controlling humidity

There are several ways to measure the moisture content of the air in a poultry house, with the most common being the psychomotor dry/wet bulb or the mechanical hygrometer. Measuring the moisture content in the air may be useful, however there are higher relative costs involved in the measurement of the humidity compared to measurement of temperature alone. Due to this, the moisture content of air is not commonly measured.

Humidity is controlled by the intense heating or cooling of house air in response to the temperature outside the house. When outside temperatures are low, relative humidity in the house is low, which often results in dry dust circulating in the air within the house. If the relative humidity is too high, this may result in wet litter. The ideal relative humidity for poultry is 60-80%.

Air composition

The most important components of air are nitrogen (N_2, approximately 79%) and oxygen (O_2, 20.3%). In addition to these main components there are several other gasses such as carbon dioxide (CO_2), and water (H_2O). Birds inhale O_2 and exhale CO_2 and H_2O. True 'lack of oxygen' does not occur in poultry houses because animals can inhale sufficient oxygen even if the oxygen levels in the air are substantially lower than normal. What is called 'lack of oxygen' in practice is, in reality, often a combination of high CO_2 concentration, high temperatures and high humidity.

Harmful gasses in poultry houses are:

- **Carbon dioxide (CO_2)** - The carbon dioxide in poultry houses largely originates from air exhaled by the birds. The CO_2 content of the air is used to measure the effectiveness of ventilation.
- **Ammonia (NH_3)** - Ammonia is a product of bacteriological processes in the manure. It is easily bound to water. Ammonia is lighter than air and thus it rises in the air. The ammonia content of the poultry house air depends on ventilation, temperature, relative humidity and stocking density. High ammonia concentrations irritate the mucous membranes.
- **Hydrogen sulphide (H_2S)** - H_2S is released when organic matter (protein) in the manure decomposes. It has an offensive smell (rotten eggs) and is a very dangerous gas. When the manure is stirred or removed from the pit, the H_2S is released into the air. Even low concentrations of hydrogen sulphide in the air can be fatal for humans and animals. This is why it is important to ventilate at maximum capacity while stirring or removing the manure.
- **Carbon monoxide (CO)** - Carbon monoxide is an odourless, very dangerous gas. It is the result of incomplete combustion due to a lack of oxygen (O_2) in gas heaters (clean filters).
- **Sulphur dioxide (SO_2)** - Sulphur dioxide develops when oil is used as fuel. The cleaner the oil, the less SO_2 is formed. The Maximum gas concentrations allowed in European poultry houses are in the table below.

Table 2. Gas Standards for European poultry houses

CO	0
CO2	<2500 ppm = 0.25 vol%
NH3	<25 ppm = 0,0025 VOL%
H2S	0
SO2	0

(1 volume % = 10.000 ppm)

Measuring gas content of air

A gas detector can be used to measure the gas content of the air. All measurements should be done at animal level. The device consists of a pump and its most important components are the tubes which are necessary to determine the gas content. The tubes are filled with a chemical substance that changes colour when air which contains the gas being measured passes through it. There are special tubes for determining the CO_2, NH_3, H_2S, SO_2 and CO contents of the air.

Measuring and controlling dust particles

Dust is harmful to the health of humans and animals and has a negative influence on the house climate. The functioning of equipment may also be seriously hampered by dust, including heating, lighting, and ventilation, and dust has also been shown to carry micro-organisms. The dust in poultry houses mainly consists of skin particles, feathers, feed particles, litter and dried manure.

The amount of dust in poultry houses is seldom measured. It can be measured in many different ways, however the processes are cumbersome and often require a multiple pieces of equipment as it is not known what is being carried in the dust each time the measurement is taken.

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It is currently difficult to give practical advice on how to measure the amount of dust, and what to measure for.

The amount of dust in a house depends on many different factors. These include temperature, relative humidity, type and age of the animals, type of litter used, feeding system, hygiene, etc. Proper maintenance of poultry houses and regular cleaning creates more comfortable conditions for animals and better working conditions for humans.

Air movement and airspeed

Whether or not birds are comfortable is very much influenced by air velocity and air temperature. Young animals are more sensitive to these factors than older, heavier animals. Taking into consideration the recommended temperatures, the air velocity at animal level is allowed to vary between 0.1 and 0.2 m/second. If house temperatures are low, the animals experience higher air velocities as a (severe) draft which can lead to disease. A simple way of determining the (negative) effect of drafts is the 'draft value'.

The draft value is the temperature difference between the house air and the incoming air (in degrees Celsius) multiplied by the airspeed in m/sec (D= (OT - IT) X S D = Draft value OT = Outside Temperature IT = Inside temperature S = airspeed at bird level in m/sec). The standard for the draft value is a value less than 0.8. If the draft value is more than 0.8 there is risk for drafts to occur in the poultry house. If temperatures are higher than 25-30°C, air velocities of higher than 0.1-0.2 m/second will actually have a positive effect and help to cool the animals.

The air movement pattern within a house is easier to control in this way as the influence of air velocity and outside temperature are less. It is not possible to give rules for the air movement pattern within a house because the air movement patterns depend on the ventilation within a house, the house width, the slope of the roof and the way the house is organized.

Measuring air velocity

Air velocity can be measured using an anemometer. The air movement pattern within a house can be made visible by using a smoke generator or smoke powder.

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Poultry Industry Dialogue Through Collaboration & Expertise

The Zamira team at the seminar hosted in Pune, Maharashtra.

Zamira Australia, in collaboration with the Poultry Federation of India (PFI) and VIV Select India, hosted a high-impact industry seminar on 20 March 2026 at Hotel Parc Estique, Pune, Maharashtra.

The event brought together over 50 experienced veterinarians from across Maharashtra, alongside leading poultry professionals representing integration, feed manufacturing and animal health sectors. The gathering served as a valuable platform for knowledge exchange, reflecting a shared commitment to advancing the Indian poultry industry through collaboration, innovation and technical excellence.

The seminar was headlined by a keynote address from Dr. Chittaranjan R. Behl, a distinguished poultry expert in strategy and operations with over 32 years of experience in poultry integration and processing. Dr. Behl's session, *"India's Poultry Integration and Processing Landscape,"*offered a comprehensive analysis of key industry dynamics, including the drivers of chicken consumption, the growth trajectory of both global and Indian broiler markets, and the significant potential of the processed poultry segment in India.

Drawing on decades of experience, Dr. Behl highlighted that milk cooperatives and broiler integration remain among the most successful and sustainable models within the livestock sector, underpinning strong compound annual growth over recent decades. He further emphasised the need for a phased transition towards a "farm-to-fork" model—supported by upgraded farm infrastructure and modern processing facilities—to meet evolving consumer expectations around hygiene, quality and food safety.

The seminar commenced with a welcome address from Dr. Shaveta Sood, Director - South Asia, Zamira Australia, and Executive Committee Member of PFI. This was followed by remarks from Dr. Jagdish Kadyan, Manager, PFI, and Dr. Sujit Kulkarni, Executive Committee Member and Head of the Skill Development and Promotion Committee, PFI, who extended an invitation to attendees to participate in the upcoming VIV Select India exhibition.

The session also included a presentation from Dr. Shailaja Rajyam, Product and Marketing Manager at Zamira Australia, who outlined Zamira's product portfolio and its focus on science-driven solutions to support poultry health, productivity and performance.

The event concluded with a vote of thanks from Dr. Shaveta Sood, Dr. Sujit Kulkarni, and Mr. Kunal Khambayati, Zamira's Regional Sales Manager, along with the Zamira team, followed by a networking dinner.

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Dr. Sujit Kulkarni, Poultry Federation of India, with keynote speaker Dr. Chittaranjan R. Behl

Dr. Chittaranjan R. Behl engaging with delegates during his keynote presentation

Dr. Shailaja Rajyam, Product and Marketing Manager, Zamira Australia, presenting on Zamira's product portfolio

Dr. Shaveta Sood and Dr. Chittaranjan R. Behl acknowledging Dr. Jagdish Kadyan of the Poultry Federation of India for his support of the event

Dr. Shaveta Sood and Dr. Sujit Kulkarni expressing their appreciation to keynote speaker Dr. Chittaranjan R. Behl

Delegates and industry professionals at Zamira's Pune seminar, delivered in collaboration with the Poultry Federation of India and VIV Select India.

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Northern Region

COMPANY: IB Group
FARMER NAME: Mr. Rajesh Yadav

MARCH-2026	Top #1
Farm Type	Open House
State	UTTAR PRADESH
Chicks Placed	6624
Mean Age	42.0
Avg Body Wt	3308
FCR	1.481
cFCR	1.190
Livability%	96.5
Daily Gain	78.8
EPEF	513.0

Eastern Region

COMPANY: IB Group
FARMER NAME: Mr. Sontosh Basumatary

MARCH-2026	Top #1
Farm Type	Open House
State	ASSAM
Chicks Placed	1593
Mean Age	39.0
Avg Body Wt	2816
FCR	1.364
cFCR	1.183
Livability%	93.7
Daily Gain	72.2
EPEF	496.1

Central Region

COMPANY: IB Group
FARMER NAME: Mr. Pranit Moreshwar Gohane

MARCH-2026	Top #1
Farm Type	Open House
State	MAHARASHTRA
Chicks Placed	7909
Mean Age	43.0
Avg Body Wt	3557
FCR	1.579
cFCR	1.233
Livability%	91.3
Daily Gain	82.7
EPEF	478.5

South Region

COMPANY: IB Group
FARMER NAME: Mr. Shidray Kalelli

MARCH-2026	Top #1
Farm Type	Open House
State	KARANATAKA
Chicks Placed	3247
Mean Age	39.0
Avg Body Wt	2765.0
FCR	1.479
cFCR	1.309
Livability%	93.6
Daily Gain	70.9
EPEF	448.5

MARCH-Top PERFORMANCE BY AREA

Area	Chicks Placed	Mean Age	BW	FCR	cFCR(2Kg)	Livability%	Daygain	EPEF
North EC House	10381	44.0	3666	1.581	1.211	95.5	83.3	503.1
North Open House	6624	42.0	3308	1.481	1.190	96.5	78.8	513.0
East EC House	17953	42.0	3091	1.437	1.195	95.1	73.6	487.1
East Open House	1593	39.0	2816	1.364	1.183	93.7	72.2	496.1
Central EC House	7909	43.0	3557	1.579	1.233	91.3	82.7	478.5
Central Open House	3994	36.0	2652	1.426	1.281	93.8	73.7	484.4
South EC House	19148	35.0	2410	1.409	1.318	93.1	68.9	455.0
South Open House	3247	39.0	2765	1.479	1.309	93.6	70.9	448.5

MARCH-Top 10 FIELD PERFORMANCE

Flock	Farm Type	State	Chicks Placed	Mean Age	BW	FCR	cFCR	Livability%	Day Gain	EPEF
Flock 1	OPEN SHED	ASSAM	1593	39.0	2816	1.364	1.183	93.7	72.2	496.1
Flock 2	OPEN SHED	ASSAM	1895	37.0	2765	1.357	1.187	92.6	74.7	510.0
Flock 3	OPEN SHED	UTTAR PRADESH	6624	42.0	3308	1.481	1.190	96.5	78.8	513.0
Flock 4	OPEN SHED	UTTAR PRADESH	3000	35.0	1609	1.104	1.191	87.8	46.0	365.7
Flock 5	CLOSED SHED	BIHAR	17953	42.0	3091	1.437	1.195	95.1	73.6	487.1
Flock 6	OPEN SHED	ASSAM	1872	36.0	2618	1.332	1.195	92.4	72.7	504.3
Flock 7	OPEN SHED	UTTAR PRADESH	1579	38.0	2864	1.387	1.195	96.6	75.4	525.1
Flock 8	OPEN SHED	ASSAM	1357	38.0	2728	1.357	1.195	96.2	71.8	508.8
Flock 9	OPEN SHED	ASSAM	1800	37.0	2666	1.345	1.197	96.9	72.1	519.1
Flock 10	OPEN SHED	PUNJAB	2509	35.0	2462	1.300	1.197	93.7	70.3	507.2

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TECHNICAL BULLETIN

Huveshield™ NDK: Field Validation of Protective Immune Response Against Newcastle Disease Virus in Poultry

KEY TAKEAWAYS

- Huveshield™ NDK vaccination induced protective HI antibody titres in breeder, layer, and broiler flocks under commercial field conditions.
- Robust humoral immune responses were observed after more than three weeks post-vaccination.
- The vaccine demonstrated consistent immunogenicity across multiple geographic regions of India.
- Observed regional variations in antibody titres highlight the importance of optimal vaccine handling, administration practices, and flock management.
- The results support Huveshield™ NDK as an effective component of Newcastle Disease prevention programs in commercial poultry production.

INTRODUCTION

Huveshield™ NDK is an inactivated Newcastle Disease vaccine formulated with the lentogenic **LaSota strain** of Newcastle Disease Virus (NDV) in an oil and water emulsion. Huveshield™ NDK is designed to provide sustained antigen release, promoting prolonged immune stimulation and durable protective immunity against the target pathogen.

Monitoring vaccine induced immunity under field conditions is essential for evaluating vaccine performance. Serological assessment of NDV specific antibodies remains a widely accepted approach for measuring immune response following vaccination.

TECHNICAL NOTE

The Hemagglutination Inhibition (HI) assay is widely recognized as the gold standard serological method for evaluating antibody mediated immunity against Newcastle Disease Virus in poultry. HI titres are commonly used to assess vaccination success and monitor immune status in commercial flocks.

Protective antibody levels detected in vaccinated birds indicate successful immunogenic stimulation following vaccination and provide an important indicator of population level protection against Newcastle Disease.

OBJECTIVE

To evaluate the immunogenicity and field effectiveness of the **Huveshield™ NDK** vaccine by analysing the serological immune response in vaccinated poultry through determination of antibody titres against Newcastle Disease Virus (NDV).

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TECHNICAL BULLETIN

STUDY PERIOD

October 2025 – February 2026

STUDY SET-UP

Poultry farms located across different regions of India were included in the field evaluation. Breeder, layer, and broiler flocks were vaccinated with the **Huveshield™ NDK vaccine** according to the recommended vaccination schedule and dose.

Blood samples were collected from vaccinated birds after more than **three weeks post-vaccination** to assess the development of humoral immune response. Serum samples obtained from these blood samples were subjected to serological analysis.

STUDY DESIGN

This study represents a **retrospective serological evaluation of Newcastle Disease vaccination response** in poultry populations. The analysis was performed using **310 serum samples** collected during routine monitoring of **20 vaccinated flocks** between **October 2025 and February 2026**.

MEASUREMENT PARAMETERS

The immune response to vaccination was assessed using the following parameters:

- Hemagglutination (HA) test for determination of NDV antigen titre before HI test.
- Hemagglutination Inhibition (HI) test for quantification of NDV specific antibodies in serum samples.
- Mean HI antibody titres across different poultry farms.
- Uniformity of immune response within flocks.

RESULTS

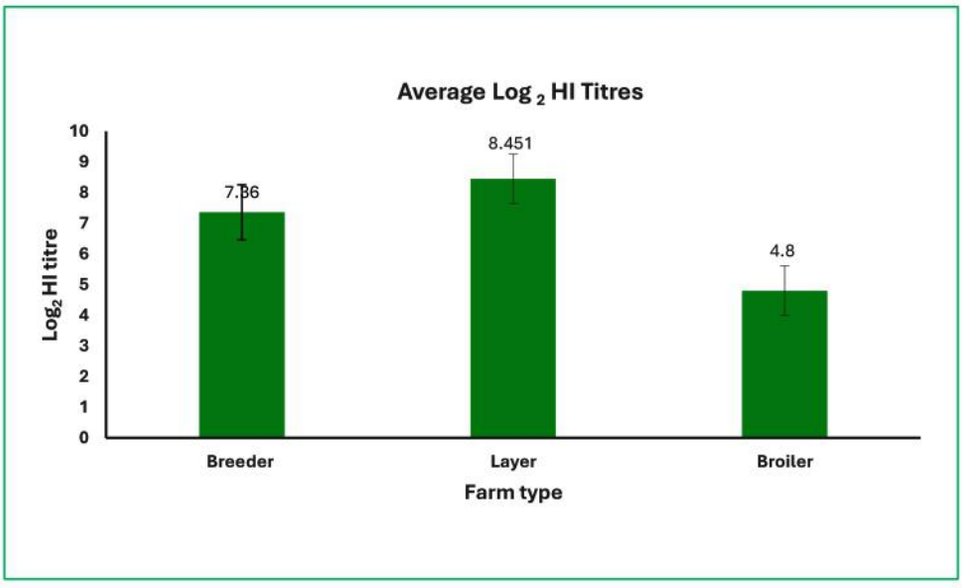

Figure: Mean Log_2 Hemagglutination Inhibition (HI) antibody titres against Newcastle Disease Virus (NDV) in serum samples collected after more than three weeks post vaccination with Huveshield™ NDK across different poultry farms. **Note:** HI titres were determined using 4 Hemagglutinating Units (4 HAU) of NDV antigen. Values represent average antibody titres measured from field samples collected across multiple poultry farms in India during the study period (October 2025 – February 2026).

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Serological analysis revealed that **all vaccinated poultry flocks developed protective levels of antibodies against Newcastle Disease Virus**, as determined by the Hemagglutination Inhibition (HI) test.

The mean HI titres observed in different poultry farms indicated a **robust humoral immune response following vaccination with Huveshield™ NDK**. However, analysis of the data across different geographic regions showed **zone-wise variation in antibody titres**, suggesting differences in immune response intensity between locations. Such variability may arise from factors including flock management practices, vaccination handling, environmental conditions, and bird health status.

INTERPRETATION

The data demonstrate that vaccination with **Huveshield™ NDK** induced measurable antibody responses in breeder, layer, and broiler flocks. Higher HI titres indicate stronger humoral immunity and better protection against Newcastle Disease.

Serological response measured by HI titres post ND vaccination are commonly used as an indicator of protective immunity and may reflect cross reactive immunity against heterologous field genotype such as VII & XIII.

FIELD STUDY DISCLAIMER

The data presented in this bulletin are derived from field monitoring of commercial poultry flocks vaccinated with Huveshield™ NDK between October 2025 and February 2026. Immune responses observed under field conditions may vary depending on factors including flock management practices, vaccination schedule and technique, environmental conditions, and overall bird health status.

CONCLUSION

Field serological monitoring demonstrated that Huveshield™ NDK vaccination consistently induced protective levels of NDV specific antibodies in breeder, layer, and broiler flocks under commercial poultry production conditions.

The strong humoral immune responses observed across multiple geographic regions reinforce the reliability, immunogenicity, and field performance of Huveshield™ NDK as an effective vaccine for Newcastle Disease control in poultry.

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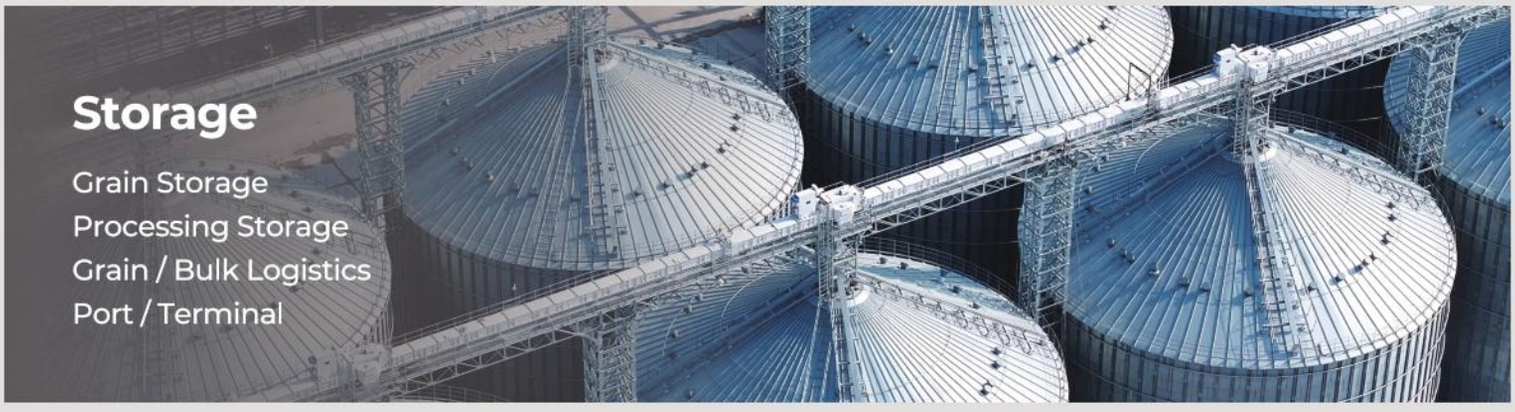

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ARTICLE

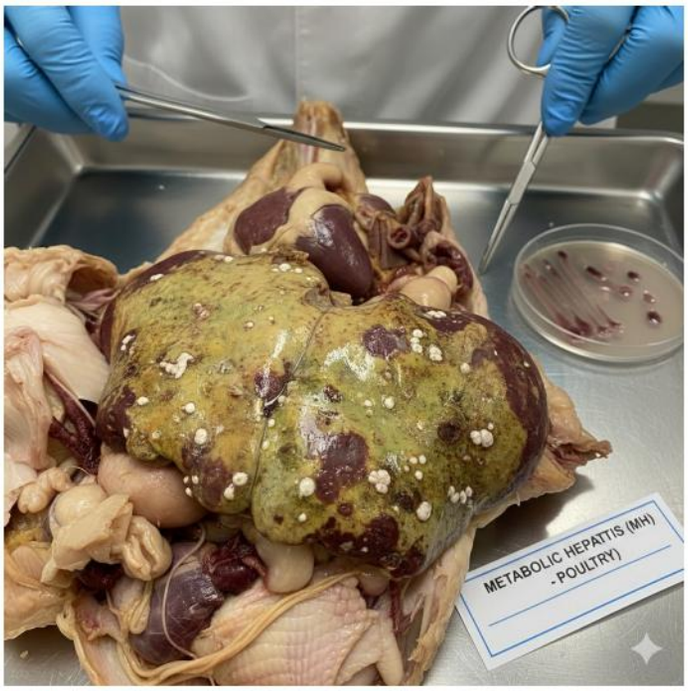
Metabolic Hepatitis (MH) in Poultry

Dr. S.K. Maini

The following group of poultry problems can be put together under one heading, the **Metabolic Hepatitis (MH)**, they are Inclusion Body Hepatitis (IBH), Fatty Liver and Kidney Syndrome (FLKS) and Fatty Liver Hemorrhagic Syndrome (FLHS), as their symptoms and lesions are similar, overlapping and difficult to differentiate, they all show enlarged, pale, febrile, liver's, sometimes with hemorrhage's and necrotic foci, swollen and enlarged kidneys, fluid in pericardial sac, hemorrhages on skeletal muscles etc.

Metabolic Hepatitis (MH) is caused by a combination of several factor's, like the presence (detectable and non detectable) of a variety of mycotoxins and their metabolites, cause inflammation and damage the G I Tract leading to leaky Gut, allowing unwanted nutrients, non-nutrients, bacteria, virus's and fungi etc., to escape into the blood stream, reach the liver and disturb energy metabolism, interfere with the thyroid, its functioning and the growth hormones and the suppression of the immune system, in-adequate bio-security procedures and practices, various stresses (avoidable and un-avoidable), certain medicines, chemicals and drugs and their in-compatibilities, certain management practices and the contamination of environment, feed and water.

As the signs, symptoms and lesions of IBH, FLKS and FLHS are similar and overlapping, with in-adequate laboratory support for the confirmation of the diagnosis, guesswork and individual opinion's prevail, often followed by mis-diagnosis and wrong treating, and recommending vaccines (required or not) like the IBH, IBD, EDS and CIA or blaming the transmission as Vertical, from the parent stock breeders and the hatchery.



The demand for fast growth, low FCR and economical production, in minimum number of days to market, have pushed the nutritionist and feed manufacturing units to produce high protein high energy feeds to give the desirable results. Use of alternate feed ingredients and oils (fats) to provide energy, have further complicated the situation.

The sequence of events leading to the liver and kidney's damage through the high protein and high energy feeds is due to the stress created by the presence of multiple mycotoxins and their metabolites, certain anti nutrients, in-compatible drugs, chemicals and medicines, they first damage the G I tract, cause inflammation leading to leaky gut, allowing mycotoxins, their metabolites and anti-nutrients and a variety of damage causing micro-organisms (bacteria, virus's, fungus and parasites) to pass through and reach the livers, cause damage and interfere with and disturb the metabolic activity, interfere with the thyroid, its functioning and the growth hormones, simultaneously causing immune-suppression, due to the oxidative changes from the rancid oil, causing cellular and tissue damage and interfering with the fatty acid metabolism. The immune suppressed birds fail to mount sufficient immune response to the vaccines used (un-explainable partial vaccine failure), become prone to several bacterial and viral diseases, leading to poor health, poor FCR, increase in morbidity and mortality.

Mitigation Strategies should include, good quality feed ingredients at all the times, plan all programs for minimum possible stress to the birds, use of a combination of toxin binders (as one binder can never prevent all types of mycotoxins and their metabolites), maintain G I tract integrity, minimize inflammation and damage, testing of the oil being used, for the free fatty acids and oxidative changes, use of anti-oxidants and regular use of probiotics, and immune system boosters, a suitable area related vaccination program and the use of proper and appropriate hygiene and sanitation practices..

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Availability of Methionine

Bioactive Natural Methionine + SAM + Serine

Methyl Synthase + Methionine Adenosyl Transferase (MAT) Enzyme

Conversion to SAM

Sparing of Methionine

Betaine + Folic acid + Organic Sulfur Compounds

Phosphatidyl Choline + Folic acid

Recycling of Methionine

SMART SOLUTION AMPLIFIES PERFORMANCE

USAGE

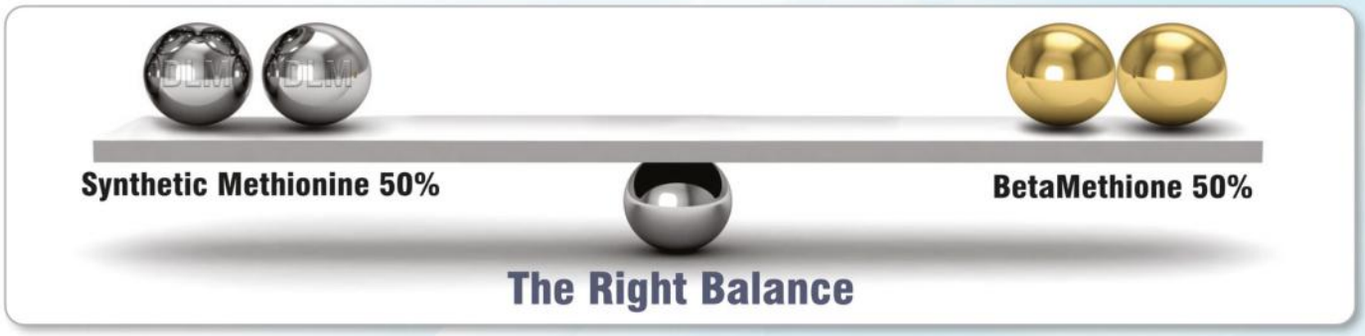
- Helps regular and optimum biosynthesis and availability of methionine
- Facilitates more efficient transmethylation reactions
- Optimizes protein synthesis, energy metabolism and carcass quality
- Maintains a balance in the metabolic pool of methionine and methyl donors
- Helps to reduce feed cost, whilst maintaining performance of birds at optimum levels

FEED INCLUSION RATE

BetaMethione can be used in place of same quantity of synthetic dl-methionine in poultry ration facilitating higher profits and optimum production performance.

In commercial practice, it is recommended to use 50% BetaMethione and 50% DL-methionine of the total supplemental methionine requirement

PRESENTATION
25 Kg Pack.



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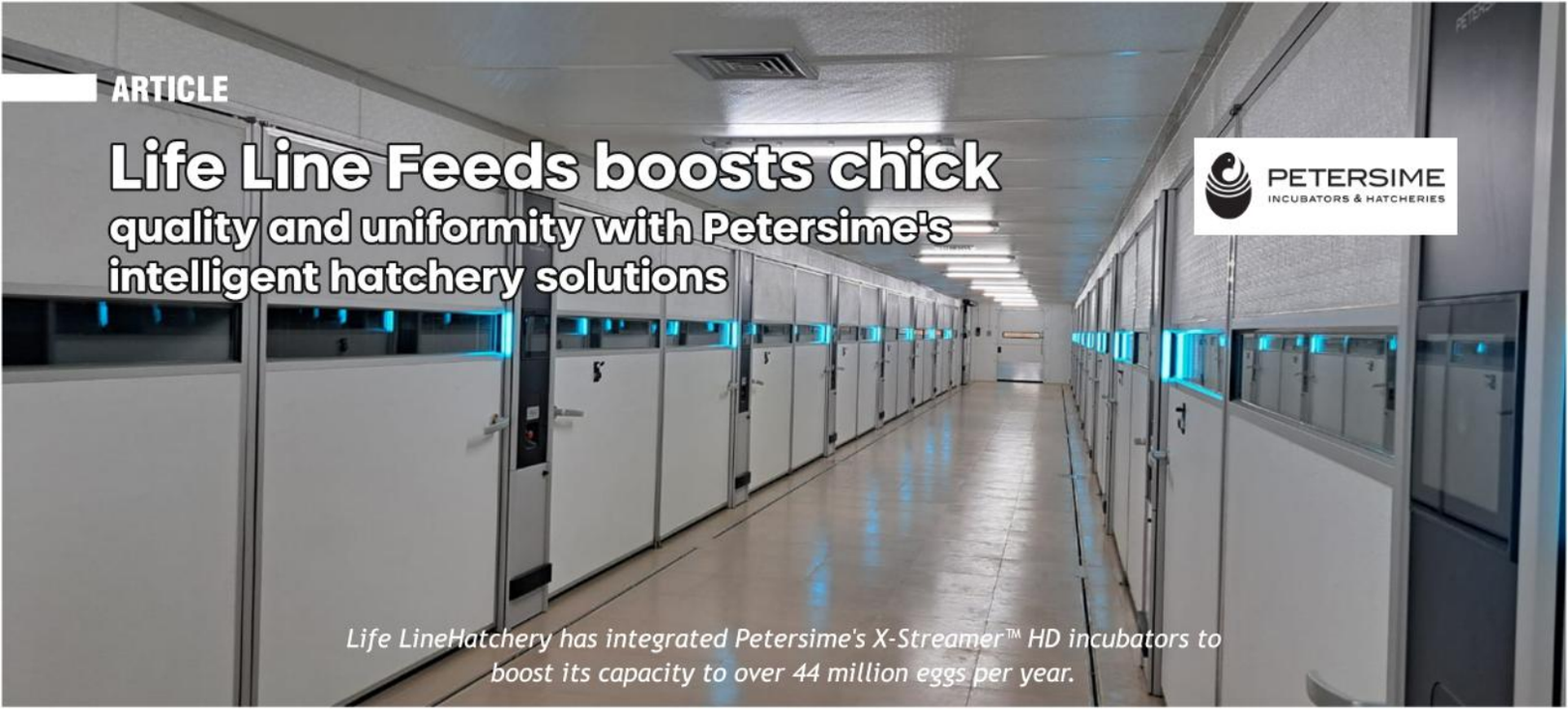
ARTICLE

Life Line Feeds boosts chick quality and uniformity with Petersime's intelligent hatchery solutions



Life LineHatchery has integrated Petersime's X-Streamer™ HD incubators to boost its capacity to over 44 million eggs per year.

Life Line Hatchery in Chickmagalur, Karnataka, took a major step in its mission of "Hatch to Health", delivering healthy, robust chicks into the poultry value chain. By integrating X-Streamer™ HD incubators, Eagle Trax™ software and an advanced HVAC system, the expanded hatchery boosts capacity to over 44 million eggs per year - a milestone that reflects the company's drive for ongoing innovation, maximum biosecurity and true excellence in chick quality.

Advanced technology that makes the difference

At the heart of the expansion are17 X-Streamer™ 24S HD setters, 12 X-Streamer™ 8H HD hatchers and an advanced HVAC system, ensuring consistent, high-quality hatch results. X-Streamer™HD incubators incorporate Embryo-Response Incubation™ technology and are supported by Eagle Trax™ software. They automatically provide precise setter and hatcher programming information for each specific batch of eggs. The result: **improved hatch outcome, stronger post-hatch performance and measurable gains in chick yield and robustness** - not only for eggs from easy-to-incubate mid-age flocks, but also for more challenging young and old flocks.

MrNandan Hegde, Director at Life Line Feeds, highlights the impact of the new technology: "We've seen excellent hatch results thanks to the intelligent incubator functions that enhance ease of incubation and ensure smooth, error-free operation - all backed by Petersime's dependable, dedicated service."

MrArjun Hegde, Director at Life Line Feeds, adds: "For large operations like our Life Line Hatchery, data and traceability are of key importance. Petersime's data-driven solution offers this vital aspect for better control,regulatory compliance, supply chain integrity and customer service."

Stronger chicks, better results

The upgrade not only strengthens incubation performance but also delivers **clear benefits throughout the production chain.** Stronger, more uniform chicks improve post-hatch performance and reduce downgrades in processing, boosting results for Life Line's trusted "tender chicken" brand. By combining Petersime X-Streamer™ technology, precise Embryo-Response Incubation™ and reliable service, the hatchery brought its "Hatch to Health" mission to life, from the egg all the way to the customer's plate.

Life Line Feeds: four decades of growth

Founded in 1985 as OM Traders, Life Line Feeds has grown into a **fully integrated poultry group** with commercial broiler farms, breeding units, a modern chicken processing plant under the "tender chicken" brand, feed mills with captive soya extrusion, retail outlets and exports. With its newly expanded hatchery in partnership with Petersime, Life Line Feeds continues to uphold its mission of "Hatch to Health", ensuring the output of uniform, high-quality chicks and reinforcing the reliability of its products.

Chairman and Managing Director of Life Line Feeds, Mr K. Kishore Kumar Hegde

X-Streamer™

The intelligent incubator that turns data into maximum hatchery performance

Petersime's new X-Streamer™ brings incubator intelligence and performance to the next level. The X-Streamer™ is the first intelligent incubator that turns data into maximum hatchery performance. It knows which eggs are on board and uses this knowledge to help you maximise incubation performance, while minimising operational costs.

This ensures you get the best economic return out of your hatchery; not just right now, but during its entire lifetime. Maximum profit for life is what we stand for.

Built-in intelligence

Unique Embryo-Response Incubation™ technology

Designed for minimum operational costs

Scan for more information:

Venworld Strengthens Poultry Farming Through Technical Meetings in Coastal Andhra

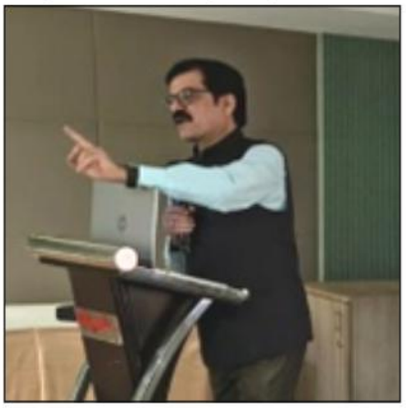
As part of its "Venworld Connect" initiative, Venkateshwara B. V. Biocorp Pvt Ltd recently conducted a series of impactful technical meetings across the Coastal Andhra region, covering prominent poultry belts of East and West Godavari. Organized between 10th and 14th March 2026, the meetings were held at key locations including Visakhapatnam, Vijayawada, and Guntur. The events witnessed strong participation from poultry farmers, integrators, and industry stakeholders, reflecting the growing shift toward scientific nutrition and performance-oriented management practices. Designed to benefit both broiler and layer segments, the meetings focused on delivering practical, field-relevant knowledge supported by scientific advancements.

At the inaugural sessions, Mr.Lokesh R. D. (AGM - South) and Mr.SriRani Ravi Kumar (Zonal Manager) addressed the gathering, emphasizing the significance of nutrition in achieving consistent and efficient poultry performance. They reaffirmed Venworld's commitment to partnering with farmers and industry players by offering transparent, innovative, and science-driven solutions to meet the evolving demands of the poultry sector.

Enhancing Performance through Precision Nutrition

Dr. Sunil Nadgauda (DGM - Technical, VBVBC) led the technical sessions, providing valuable insights into modern broiler nutrition. He emphasized that precision nutrition is essential for achieving optimal performance in today's high-yielding broiler strains. Highlighting the importance of maintaining the right energy-to-protein ratio, he explained how balanced feed formulation plays a crucial role in supporting growth, feed efficiency, and overall bird health. He further elaborated that targeted nutrition directly influences feed conversion ratio (FCR), body weight gain and production efficiency, and that optimal results depend on efficient nutrient utilization at the bird level. Dr.Nadgauda also introduced the newly launched Densimix 5% composite premix, a scientifically designed formulation aligned with the latest broiler nutritional requirements. The premix is tailored for modern broilers and has demonstrated excellent field results across India, with farmers reporting improved FCR, better weight gain, and consistent flock performance.

He additionally highlighted the importance of premixing in feed preparation, explaining that conventional mixing often leads to uneven distribution of micro-nutrients, resulting in performance variation. In contrast, a well-formulated composite premix ensures uniform nutrient distribution, reducing process losses, segregation and human errors during mixing. This not only simplifies feed preparation but also ensures that birds receive consistent and balanced nutrition in every feed intake, ultimately leading to improved FCR, better growth, enhanced uniformity and overall superior flock performance.



Complementing these discussions, Dr. N. Baburaj (DGM - Technical, South Zone) explained the importance of region-specific vaccination programs based on the common diseases seen in Andhra Pradesh. He highlighted that vaccination schedules should not be the same for every farm, but should be planned according to local disease conditions, farm management and flock status.He explained that proper vaccination helps build strong immunity in birds, but it is equally important to follow the right timing, correct dosage and proper handling of vaccines, including maintaining the cold chain to ensure effectiveness.Dr.N. Baburaj also emphasized that vaccination alone is not enough. It should be supported by good biosecurity, proper farm hygiene, and regular health monitoring. When all these practices are followed together, farmers can effectively control diseases, reduce losses and achieve better flock performance, livability and profitability.

Dr.Pawan Kumar (Technical sales officer) further strengthened the session by sharing farmer success stories, which resonated strongly with the audience. He highlighted the field performance of Densimix 5% premix, demonstrating how its effective use helped farmers achieve better growth, improved FCR and higher weight gain, ultimately leading to enhanced overall flock performance and profitability.

Adding another critical perspective, Dr.Siddhi Velhal (Product Executive) highlighted the importance of biosecurity in modern poultry farming. She emphasized preventive disease management and the role of strict biosecurity protocols in maintaining farm hygiene and ensuring consistent production outcomes. The session also showcased Venworld's biosecurity solutions designed to help farmers effectively manage disease risks.

Strengthening Layer Productivity and Egg Quality

The meetings also featured dedicated sessions for layer farmers, focusing on sustaining egg production and improving egg quality. Discussions underscored the importance of balanced nutrition and gut health,

particularly during the later stages of the laying cycle when maintaining productivity becomes more challenging. Special emphasis was placed on achieving uniform egg size and consistent production, which are key indicators of efficient layer management. Dr. Sunil Nadgauda explained how improved gut health enhances nutrient absorption, directly influencing egg quality parameters such as shell strength, albumen quality and overall egg consistency. He also highlighted the importance of maintaining an optimal calcium to phosphorus (Ca:P) ratio across different production phases to ensure proper eggshell formation and minimize production losses.

A key highlight of the session was EGGXTRA 5% composite premix, a targeted nutritional solution developed specifically for commercial layer operations. The formulation is designed to support sustained egg production, improve egg quality, and ensure a consistent supply of essential nutrients required for optimal flock performance. It also offers flexibility, allowing farmers to incorporate locally available raw materials of their choice, making it both practical and cost-effective. Additionally, the VBVBC nutrition team showcased their expertise in developing customized, farm-specific feed formulations tailored to individual farmer requirements and available resources. This approach enables farmers to optimize feed efficiency, effectively manage input costs, and achieve improved economic returns without compromising production performance. The sessions received highly positive feedback from farmers, who appreciated the practical insights, field-oriented recommendations, and the strong technical support extended by Venworld.

The technical meetings were made possible through the dedicated efforts of Venworld's sales and technical teams, who ensured their smooth and successful execution. Through these initiatives, Venworld continues to strengthen its commitment to advancing poultry nutrition through science, innovation, and farmer-centric solutions. By emphasizing precision nutrition, gut health,and biosecurity, the company remains a trusted partner in helping poultry farmers achieve improved performance, enhanced profitability, and sustainable growth.

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Physiological Impact of Heat Stress in Layers and Breeders: Targeted Management Using Water-Based Stress Relief Solutions

Dr. Sridhar Selvapandian
Livestock Nutritionist

Dr. Sushant Mhatre
AGM - Techno Commercial

Dr. Jayanta Bhattacharyya
Director - Techno Commercial

Introduction:

Heat stress is one of the most critical environmental challenges affecting modern poultry production, particularly in tropical and subtropical regions. Heat stress occurs when the bird's heat production exceeds its capacity for heat dissipation, leading to disruption of homeostasis. Once ambient temperatures rise above the thermoneutral zone (18-25°C), birds initiate physiological mechanisms to maintain body temperature, often at the cost of productivity and health. Heat stress (HS) is classified as **Acute** (1-24 hrs, 27-38°C), **Moderate** (up to 7 days), or **Chronic** (over 7 days), causing significant economic losses (Oluwagbenga *et al.*, 2023)

In layers and breeders, these physiological disturbances directly impair egg production, shell quality, fertility, and hatchability. Understanding these internal changes is essential for designing effective mitigation strategies.

Thermoregulatory Physiology in Poultry:

Unlike mammals, poultry lack sweat glands and rely primarily on the following:

- Respiratory evaporation (panting)
- Peripheral vasodilation
- Behavioral adaptations (wing spreading, reduced activity)

When environmental temperature rises:

- Sensible heat loss (radiation, convection, conduction) becomes ineffective
- Evaporative cooling becomes the primary mechanism

However, this shift leads to **serious physiological imbalances**, particularly in acid-base status and metabolism (Wasti *et al.*, 2020)

a. **Acid-Base Imbalance:** Heat stress-induced excessive panting causes respiratory alkalosis, lowering CO_2 and raising blood pH. This reduces ionized calcium, impairing eggshell formation and enzyme activity, resulting in thin, poor-integrity shells. Heat stress reduces egg quality, lowering egg weight (3.24%), shell thickness (1.2%), shell weight (9.93%), and egg shell percent (0.66%), thereby significantly increasing breakage (Ebeid *et al.*, 2012).

b. **Metabolic Alterations:** Heat stress in poultry disrupts energy and nutrient metabolism by decreasing feed intake to reduce metabolic heat. This shifts the state to catabolic, increasing body fat and lowering protein. Energy reallocates from production (e.g., egg formation) to survival (thermoregulation), severely compromising performance.

- **Layers:** Experience lower haugh unit, egg weight, poorer albumen, and thinner shells.

Quantified Decline: Egg production progressively decreases: 13.2% (8-14 days), 26.4% (30-42 days), and 57% (43-56 days) (Sesay *et al.*,2022). Additionally, Lara et al.(2013) reported a reduction of 31.6% in feed conversion, 36.4% in egg production, and 3.41% in egg weight.Haugh unit scores also decrease by 5-8% (Almatary *et al.*,2026)

- **Breeders:** Show poor body condition uniformity and reduced reproductive efficiency.

c. **Neuroendocrine Response:** Heat stress activates the Sympathetic-Adreno-Medullary (SAM) and Hypothalamic-Pituitary-Adrenal (HPA) axes, causing the release of glucocorticoids (corticosterone).

d. **Immune Suppression:** Heat stress weakens immunity, leading to reduced lymphocyte proliferation and antibody production, increased infection susceptibility, vaccination failure, and chronic disease due to immunosuppressive glucocorticoids.

e. **Gut Disruption:** Heat stress causes "leaky gut" (increased permeability, disrupted tight junctions) and dysbiosis (reduced beneficial bacteria, increased pathogens), resulting in poor nutrient absorption and systemic inflammation.

f. **Reproductive Decline:** Heat stress in layers decreases egg production (15-25%), worsens shell quality, and increases breakage by impairing hormonal secretion (GnRH, LH, FSH) and calcium metabolism. Breeders

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are highly sensitive, experiencing reduced fertility (10-20%), lower hatchability, and increased embryonic mortality. This is due to reduced sperm quality/motility in males and impaired yolk formation in females. Aswathi *et al.* (2019) reported a reduction in fertility percentage (-7.22%) and hatchability of fertile egg sets (-2.51%) in breeders. Maternal stress also impacts offspring. For example, breeders show 48% lower sperm penetration at 27°C versus 21°C. (Mcdaniel *et al.*, 1996 and Oluwagbenga *et al.*, 2023).

g. **Cellular Adaptation:** Heat stress triggers protective **heat shock proteins (HSPs)** to maintain cellular homeostasis, but prolonged stress overwhelms this mechanism, causing cellular dysfunction.

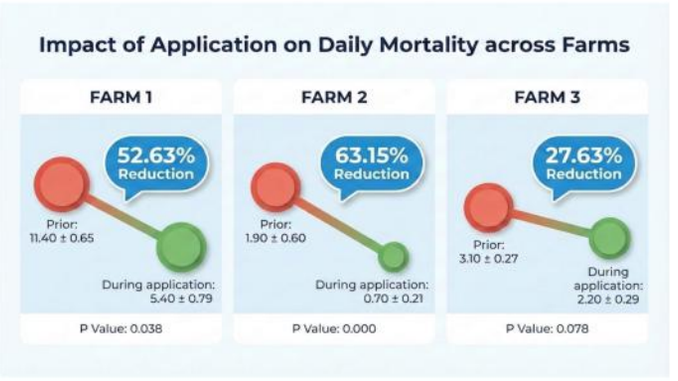
Nutritional Strategies for Managing Heat Stress:

Nutritional strategies are crucial for managing heat stress by correcting the internal physiological imbalances it causes. The primary goals are to restore electrolyte and acid-base balance, minimize oxidative stress, and maintain gut health. This is achieved through the targeted use of essential nutrients, including electrolytes; vitamins (C, E), minerals (zinc, selenium), amino acids, and probiotics.

The impact of heat on water intake is significant: birds increase their water consumption by 1.2% for every 1°C rise in the temperature range of 22-32°C and by 5% for every 1°C rise between 32 and 38°C (Sohail *et al.*,2012). This elevated water intake is a natural mechanism to help control body temperature in hot environments. Since feed intake typically drops during heat stress, delivering these critical nutrients, which must be optimally utilized alongside the increased water intake and a sufficient oxygen supply, is most effective via drinking water, ensuring rapid absorption.

Some proprietary formulated anti-stress preparations could be the choice for preventing heat stress in poultry. Selection of the ingredients and concentration of critical ingredients in the water-soluble antistress formula are key important factors. The following nutritional and non-nutritional components have specific roles in managing heat stress in poultry in general.

A study across three commercial layer farms during summer heat (40°C) evaluated the efficacy of water-soluble antistress formula (Pollstress® *Dry*) manufactured by Bentoli in reducing high-temperature stress mortality. Analysis of daily bird mortality 10 days before and during the 10-day application showed:



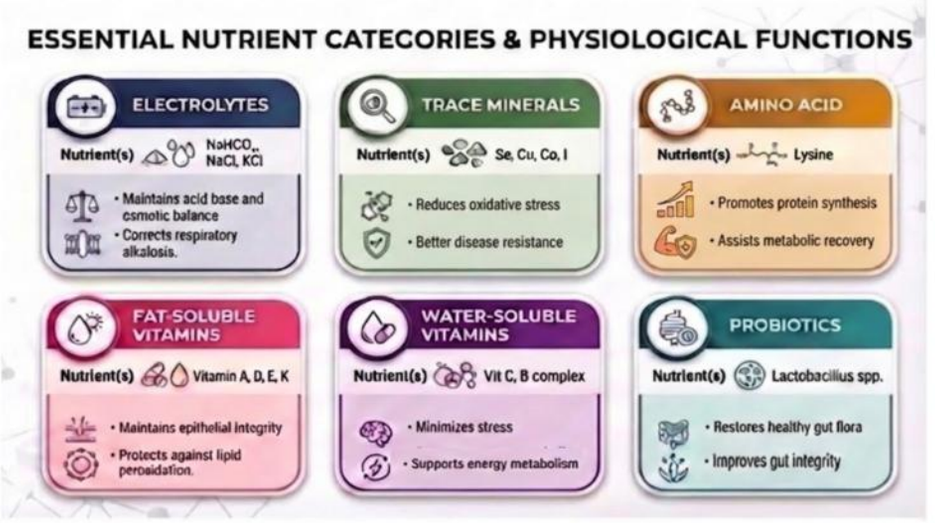
It was evident that the antistress formula, suitably designed, can successfully reduce bird mortality and can manage the flock health at an optimum level.

Conclusion:

Heat stress severely impacts layers and breeders, harming metabolism, immunity, gut, and reproductive health. While environmental control is vital, water-based nutritional strategies offer the fastest way to restore balance and maintain homeostasis. Immediate water supplementation corrects fluid/electrolyte imbalances. A water soluble antistress product can provide a comprehensive solution by restoring electrolyte/acid-base balance, supporting osmoregulation, reducing oxidative stress, and stabilizing neuroendocrine function. Administer antistress product through drinking water during peak heat, alongside continuous access to clean, cool water, to ensure effective management and sustained productivity.

References:

Will be provided on request



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Research-Driven Innovation and Quality Systems in Animal Healthcare
The PVS Group Model

PVS Group, a leading Indian manufacturer and exporter in the poultry, veterinary, and aquaculture sectors, has established a significant global presence across more than 65 countries. The organization's growth trajectory is underpinned by a research-centric approach, integrating advanced R&D capabilities with stringent quality systems aligned to international regulatory frameworks.

R&D Infrastructure and Focus Areas

The company's Research and Development division is structured to support both exploratory and applied research in animal healthcare. Equipped with advanced analytical instrumentation and microbiological facilities, the R&D infrastructure enables systematic investigation into novel therapeutic and preventive solutions. Key research domains include phytogenic (herbal) formulations, immunomodulatory compounds, and microbial-based technologies, particularly probiotics.

A major area of innovation is the development and optimization of probiotic formulations. The dedicated Probiotic Division maintains a curated library of 44 characterized microbial mother strains, selected based on functional attributes such as gut colonization efficiency, pathogen inhibition, enzymatic activity, and immunomodulatory potential. These strains are subjected to rigorous in vitro and in vivo evaluation protocols to assess stability, viability, and efficacy under diverse physiological and environmental conditions. Strain development and formulation processes are guided by defined selection criteria, ensuring reproducibility and application-specific performance.

Analytical and Quality Assurance Framework

PVS Group employs a comprehensive Quality Management System (QMS) that is intrinsically linked with its R&D processes. Analytical evaluation is conducted across the entire product lifecycle, including raw material qualification, in-process monitoring, and finished product validation. Standardized analytical methods, supported by validated protocols and defined acceptance criteria, ensure consistency and reliability of results.

The in-house quality control laboratories operate in compliance with Current Good Manufacturing Practices (cGMP) and Good Laboratory Practices (GLP). These facilities are equipped to perform physicochemical, microbiological, and stability testing, ensuring adherence to both internal specifications and international regulatory requirements. Environmental monitoring, process validation, and batch traceability systems further reinforce product integrity and safety.

Process Optimization and Regulatory Alignment

Process control strategies are implemented through systematic evaluation of critical quality attributes (CQAs) and critical process parameters (CPPs). This approach facilitates robust process design, minimizes variability, and enhances scalability. Continuous improvement initiatives, supported by data-driven methodologies, enable ongoing refinement of manufacturing and quality processes.

The QMS is designed to remain adaptive to evolving global regulatory landscapes, ensuring compliance with international standards and facilitating market access across diverse geographies. Documentation practices, audit mechanisms, and risk assessment frameworks are integral components of this system.

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Translational Research and Global Impact

A key strength of PVS Group lies in its ability to translate research outputs into commercially viable products. The integration of R&D with manufacturing and quality functions enables efficient scale-up and deployment of innovative solutions. The company's expanding portfolio reflects a pipeline of science-driven products tailored to address emerging challenges in animal and aquaculture health.

Through sustained investment in R&D, coupled with rigorous quality assurance systems, PVS Group continues to contribute to advancements in animal healthcare. Its research-led approach positions the organization as a significant player in the global market, with capabilities extending from fundamental research to applied product development and international commercialization.

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Nurturing Talent, Strengthening the Poultry Industry The SEC India Way

The Soy Excellence Center (SEC) India successfully delivered its Advanced In-Person Poultry Course to a third batch of selected poultry professionals in Chandigarh on 12-13 March 2026. Through this program, SEC reinforces its commitment to building a future-ready poultry workforce. The intensive two-day program covered 11 critical technical modules, equipping 45 early/mid - career professionals with enhanced knowledge and practical competencies directly applicable to poultry operations.

Participants demonstrated improved understanding across key areas and have transitioned into active contributors within the SEC community. Collectively - three core batches comprising about 100+ SEC poultry community members steadily contribute to industry efficiencies and to the protein value chain as a whole. Also SEC India is impressed noting that 500+ poultry professionals have completed the on-line course, have earned their certificates and are part of the SEC community.

The course was led by poultry experts, Dr. Darur Allappa and Dr. V. Malathi, whose sessions strengthened technical

depth and decision-making capabilities among attendees. Learnings centered around raw material diversity and variability, deep dive into modern poultry production methods, hatchery and brooding, nutrition, biosecurity, layer hen management, health and disease prevention, feed management, heat stress and processing/ packaging/ distribution. A focused session by Dr. Vijay Anand on soy meal utilization addressing facts and future supply readinessenabled participants to better understand U.S. Soy, engage with data-driven decision making and think on lines of securing soy meal required by the industry for sustainable operations.

High engagement levels were sustained through interactive discussions, Q&A sessions, and applied quizzes, networking, peer-learning - contributing to stronger knowledge retention and peer learning.

Overall, the program contributed to developing more competent, confident, and industry-aligned poultry professionals, further advancing SEC India's mission of strengthening the protein value chain through skilled human capital

Dr. Jyoti Sahu
Associate Product Manager
Kemin Industries South Asia Pvt. Ltd.

I enrolled in the SEC India *Poultry Production and Management* course to gain a practical, field-level understanding of poultry production. The program effectively combined fundamental concepts with real-world insights, making it highly relevant.

The sessions were informative, with knowledgeable speakers and well-structured discussions. The interactive weekly sessions further strengthened my understanding.

The course provided me with a clear foundation in poultry production and management, while also improving my ability to understand field challenges.

I would highly recommend this program to professionals and individuals looking to build strong fundamentals in the poultry sector.

Dr. Biswajit Borah

Deputy Manager - Animal Nutrition, Suguna Foods Pvt. Ltd.

Participating in the SEC India Poultry Production and Management Intermediate Course was a highly enriching experience that helped me strengthen my understanding of both theoretical concepts and their practical field applications. The course was well-organized, informative, and effectively balanced theoretical knowledge with real-world insights across key areas of poultry production.

One of the most valuable outcomes for me was the ability to bridge gaps in my existing knowledge and gain practical exposure to industry practices through interactions with experts. The learnings have enabled me to better connect concepts with on-ground applications and apply them more effectively in my professional role.

I would strongly recommend this course to industry professionals, as it offers a well-rounded platform combining technical knowledge with practical insights essential for growth in the poultry sector.

Biosecurity Measures
Standard Operating Procedure (SOP)

Prabakar Ramamoorthy and R.Chanthirasekaran

Introduction:

In today's poultry industry, biosecurity is no longer an option—it is a necessity. With increasing disease pressure, intensive production systems, and frequent human and material movement across farms, even a minor lapse in biosecurity can lead to significant health and economic losses. A well-structured biosecurity program acts as the first line of defense, protecting flocks from infectious agents while ensuring sustainable productivity and animal welfare.

This Standard Operating Procedure (SOP) outlines comprehensive on-farm biosecurity measures designed to minimize disease risks at every critical control point—from farm entry and visitor management to shed hygiene, waste disposal, and flock health monitoring. By consistently implementing these **SOPs**, poultry producers can strengthen disease prevention, enhance flock performance, and maintain long-term operational reliability. The key biosecurity measures to be followed at the farm are outlined below.

- A **biosecurity signboard** stating *"Unauthorized Access Restricted"* shall be prominently displayed at the main farm entrance.
- **Lime powder shall be applied at the farm gate/entry point** to ensure that the footwear of all employees and visitors comes into direct contact with the disinfectant barrier upon entry.
- A **visitor register/logbook** shall be maintained to record the name, purpose, and duration of each visit.
- **The farm-visit history of all visitors** shall be collected and verified to ensure they have not visited any suspected or confirmed disease-affected farms within the last **three days.**
- **Detailed farm-visit history** shall be mandatorily recorded for high-risk personnel such as **vaccinators, debeaking teams, grading crews, and service technicians.**
- An **In-Pass/Out-Pass system** shall be maintained to document the movement of all materials, equipment, and supplies entering or leaving the farm.
- **Entry of outside vehicles**, including visitor vehicles, into the farm premises shall be strictly prohibited.
- All **vehicles and equipment permitted to enter the farm** shall be thoroughly cleaned and disinfected using **spray foggers, vehicle dips, and foot dips.**
- **Disinfectant footbaths** shall be provided at the farm gate and at the entrance of each shed, with **regular replacement of disinfectant solutions** to maintain effectiveness.
- **Unnecessary visitor entry shall be avoided.** In unavoidable circumstances, visitors shall be provided with **separate footwear** or **disposable slippers** before entering the premises.
- **Handwashing facilities** shall be installed and maintained at the entrance of each poultry shed.
- During disease outbreaks, **manure removal vehicles and cull bird transport vehicles** shall not be allowed to enter the farm premises.
- **Litter removal shall be avoided** during periods of high mortality or active disease to prevent cross-contamination.
- **All-weather road connectivity** up to the farm premises shall be ensured to facilitate controlled movement without compromising biosecurity.
- A **minimum distance of 50-60 feet** shall be maintained between two sheds to reduce the risk of cross-contamination.
- **Waterlogging within the farm premises shall be prevented** and shed floors shall be maintained at an adequate height above ground level.
- All **water storage tanks**, including drinking water tanks, fogger tanks, spray tanks, and sprinkler tanks, shall be **kept closed at all times.**
- **Entry of stray animals and wild birds shall be strictly restricted.** Birds subjected to post-mortem examination shall be disposed of hygienically in designated disposal pits.
- **Eggs shall be stored in a separate godown located outside the farm premises** to avoid entry of external vehicles into the biosecure zone.
- **Paper egg trays**shall be preferred during disease outbreaks to minimize contamination and avoid reuse.
- **Summer management practices**shall be implemented rigorously without compromise to reduce heat stress and immune suppression.
- **Feed and medicines** shall be stored under appropriate conditions to prevent moisture damage, contamination, spillage, and deterioration of quality.
- Following flock culling, **thorough cleaning, decontamination, and disinfection of sheds and equipment** shall be carried out as per protocol.
- An adequate **"shed rest" period** shall be observed before placement of a new flock.
- **Vaccination programs** shall be implemented strictly in accordance with the recommendations of breeders and poultry consultants.
- **Feed silos, conveyor feeding systems, and feeders** shall be cleaned and sanitized at regular intervals as per standard protocols.
- **Aerial disinfection** inside sheds shall be carried out **2-3 times per week**, depending on the disease risk in and around the farm.

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Layer Concentrates:
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Broiler Crumbs/Pellets:
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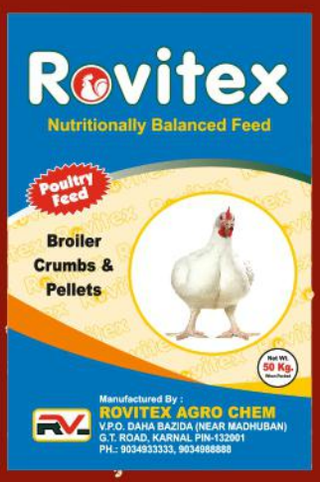

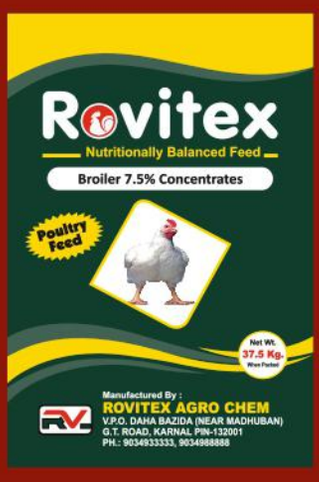

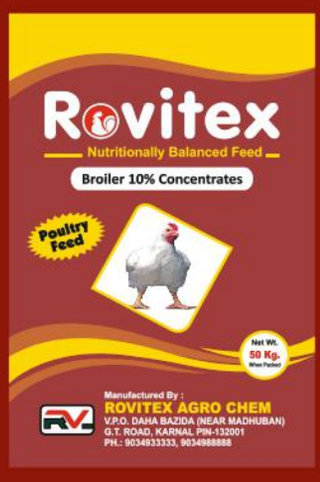

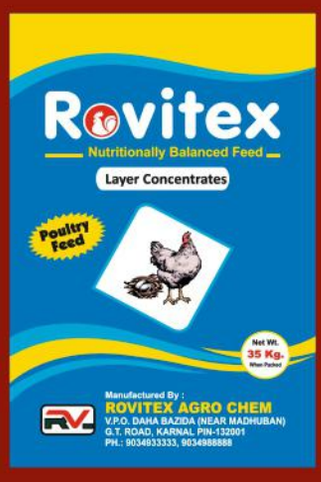

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Samarjeet Singh Lamba: +91-90349-88888, 95410-22000
E-mail: rovitexagrochem2016@gmail.com, lamba122117@gmail.com

Dealers enquiries solicited from unrepresented areas

- **Disinfectant spraying (e.g., phenols, bleaching compounds)** shall be performed regularly around each shed up to a distance of **6-8 feet** from the shed walls.
- Farm personnel shall **visit young and healthy flocks first**, followed by older flocks, and **diseased flocks last**.
- **Infected birds and contaminated materials** shall be kept strictly separate from healthy birds, and proper **hand and foot sanitation** shall be followed before entering healthy sheds.
- **Medicines and vaccines** shall be routinely checked for expiry or near-expiry and managed accordingly.
- **Sudden changes in feed or environmental conditions** shall be avoided to minimize stress.
- Farm personnel shall **avoid direct contact with secretions and excretions** of affected flocks.
- Entry of **wild birds, domestic animals, pets, and local birds** into the farm premises shall be completely prevented.
- **Biofilm formation in nipple drinker lines** shall be routinely checked and removed using appropriate water sanitizers.
- **Drinking water quality** shall be periodically tested for **pH, E. coli contamination, hardness, and ORP**, and suitable water acidifiers and sanitizers shall be used as required.
- **Mycotoxin risks** shall be managed through the use of high-quality toxin binders to prevent immunosuppression.
- **Used vaccine vials and biomedical waste** shall not be discarded within or around the farm and shall be disposed of safely away from the premises.
- **Stress-reduction strategies**, including supplementation with **Organic Chromium, Vitamin C, and 1,3 β glucans**, may be used to enhance immune resilience.
- Birds shall be **monitored daily for abnormal signs and symptoms** to minimize mortality and production losses.
- **Routine disease monitoring**, including post-mortem examinations and periodic serological antibody assays, shall be conducted to assess flock health and immune status.
- **Farm veterinarians or farm managers** shall be immediately informed in case of abnormal mortality or disease suspicion.
- **Flies, insects (including beetles), rats, and mice** shall be controlled effectively through an integrated pest management program.
- **Dead birds shall never be kept inside sheds** and shall be removed immediately.
- Carcasses shall be disposed of by **incineration or burial in designated disposal pits located at least 200 yards away** from the farm premises.
- **Post-mortem rooms and examination areas** shall be disinfected thoroughly after use, and lime powder shall be applied as appropriate.
- **Feed bags** shall be stored in crates with adequate spacing and ventilation.
- **FIFO (First-In, First-Out)** principles shall be strictly followed for all materials, including feed, medicines, and vaccines.
- **Hand sanitizers** shall be available inside sheds for immediate use after bird handling.
- After handling birds or coming into contact with secretions or excretions, **handlers shall wash hands with soap and apply hand sanitizer**.
- **Rearing of country birds or free-range birds, especially ducks**, shall be strictly prohibited in and around the farm premises.

Conclusion

A well-planned farm and management system requires **strict adherence to Standard Operating Procedures covering shed design, biosecurity, rearing practices, and record-keeping**. Consistent implementation of these biosecurity measures ensures **optimal bird health, uniform productivity, reduced mortality, and reliable operational and research outcomes.**

Prabakar Ramamoorthy and R.Chanthirasekaran

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Visit of WVPA India to

WVPA Bangladesh Branch & SAARC Agriculture Centre

World Veterinary Poultry Association WVPA India President Dr Jeetendra Varma, visited Bangladesh in the week of 5-10 April 2026. He was accompanied by Mr Habibur Rahman Bhuiyan of Zamira Bangladesh. Dr Varma visited Bangladesh Agriculture University (BAU) Mymensingh Bangladesh on6th April 2026. The purpose of the visit was to meet WVPA President Bangladesh Branch and the Executive team.

The objective of the visit was to update the BD WVPA Team on forthcoming 7th Asia Meeting to be held at New Delhi on 9-10 Oct 2026. They were appraised about the progress and the kick-off meeting WVPA India has done in the month of Jan 2026.

WBPA India team met Prof. Dr. Emdadul Haque Chowdhury, President, WVPA Bangladesh Branch, Prof. Dr. Md. Ariful Islam & Dr. Minara Khatun, Department of Microbiology and Hygiene, Prof. Mokbul Hossain, Prof. Dr. Rokshana Parvin & Prof. Dr. Munmun Pervin, Department of Pathology and other teaching staff of Faculty of Veterinary Sciences, BAU.

Dr Varma personally invited the President, Executive members to attend and actively participate in the event in Oct. He also met the students of Microbiology, Pathology and Parasitology Department and requested them to submit the research abstracts for the event. They were explained in detail about the travel grant which students can receive to attend the event. Everyone appreciated the gesture extended by WVPA India to meet them and invite them personally.

Dr Varma also met the WVPA Global General Secretary Prof Dr Rafiqul Islam on 7th April and appraised him about the progress and Kick-off meeting. Had good discussion with Prof Islam and invited him personally on behalf of WVPA India team. He was worried about the political situation between the two countries to get the visa to travel to India during the event. It was proposed that WVPA Bangladesh team will meet the High Commissioner of India in Bangladesh and request him to issue the visa on priority to visit India to attend the event in Oct 2026.

WVPA President also met Dr Younus Ali, Senior Program Specialist (Livestock) SAARC Agriculture Centre Dhaka. On personal invitation Dr Younus agreed to participate and visit India in Oct to attend the event. It was very fruitful visit of Dr Jeetendra Varma to promote the 7th WVPA Asia Meeting to neighbouring countries.

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Roundtable Dialogue

on Poultry for Protein Security A Backbone of Nutrition Security for a Viksit Bharat by The Indian Chamber of Food and Agriculture (ICFA)s

The Indian Chamber of Food and Agriculture (ICFA), convened Roundtable Dialogue on **"Poultry for Protein Security, A Backbone of Nutrition Security fora ViksitBharat"**, bringing together Policymakers, Poultry Integrators, Breeders, Feed Millers, Poultry Consultants, Senior Officials, MD's and Directors of Pharmaceutical Companies, Experts, Poultry Associations and Development Organizations from Poultry and Food Ecosystem. The dialogue focused on strengthening the role of poultry in advancing nutrition and protein security and was Chaired by Dr. PK Shukla and Dr. Tarun Shridhar (IAS, Ex Secretary, Department of Animal Husbandry) Director General, ICFA. The discussions highlighted poultry as one of the most affordable, accessible and high-quality sources of protein, with the potential to significantly improve nutrition. Access to safe, affordable, high quality protein is not just a food systems issue. It is central to building a healthier, more productive, and truly Viksit Bharat.

Key areas deliberated included:

- Poultry and Protein Security in India's Nutrition Strategy
- Food Safety, Hygiene and Consumer Trust in Poultry Value Chains
- Cold Chain, Processing Infrastructure and Market Efficiency
- Animal Health, Biosecurity and Disease Risk Management

The poultry industry was represented by Dr. Shirish Nigam, Mr. OP Singh, Dr. Elango Palaniyandi, Mr. Ricky Thaper, Dr. Anup Kalra, Dr. Gajanan Padmawar, Dr. Chittranjan Behl, Mr. Saurabh Gupta, Mr. Mohanji Saxena, Dr. Ashwani Kumar Rajput, Dr. T Kotaiah, Col. Vinay Kumar, Mr. AK Sehajpal and other dignitaries.

The discussion focused on stren henin the full value chain so that safe and affordable protein can reach eo le at scale.

Mr. Ricky Thaper, Joint Secretary, Poultry Federation of India invited the delegates to visit VIV Select India being organised by @VIV Worldwide in partnership with Poultry Federation of India from April 22-24, 2026 at Yashobhoomi Convention and Expo Center, Dwarka, New Delhi.

In closing remarks, Dr. PK Shukla highlighted that India's challenge is not poultry production but consumption. Awareness is low, demand needs to be built, and affordability and trust still limit uptake. Improving access is key to turning supply into real nutrition outcomes.

Dr. Tarun Shridhar while concluding the session said, ICFA remains committed to taking forward the insights from this dialogue into actionable policy recommendations for a healthier and nutritionally secure India. Such knowledge-driven platforms are essential for driving sustainable growth across the poultry industry. Heartfelt appreciation to Dr. Tarun Shridhar, Dr. PK Shukla, eminent poultry leaders, association members and entire Indian Chamber of Food and Agriculture (ICFA) Team for delivering outstanding program.

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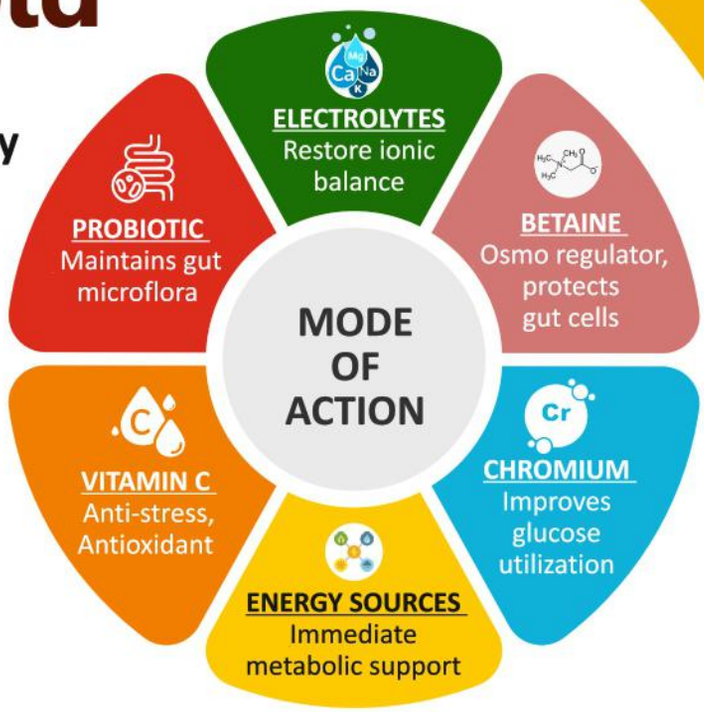

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Precision Selenium Nutrition

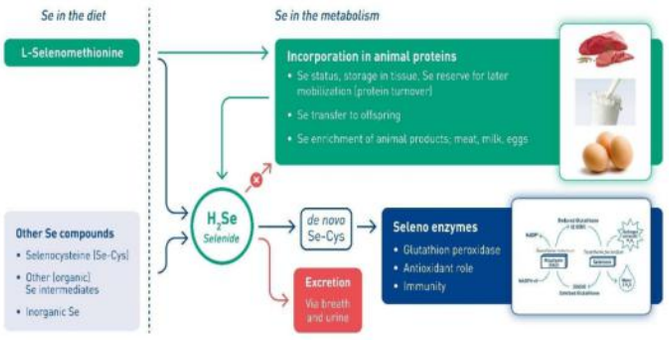
The Power of L-Selenomethionine

Jolien van Soest, Sopaphan Pruekvimolphan

Selenium (Se) is an essential trace mineral for animals, contributing to selenoprotein formation which is crucial for antioxidant defense, immunity, and thyroid function, all supporting growth, feed efficiency, and reproduction. During periods of stress—such as rapid growth, vaccination, heat, or illness—the demand for Se increases, and insufficient intake can diminish antioxidant protection, lower performance, and elevate health risks.

Unlike inorganic sodium selenite, L-selenomethionine (L-SeMet) is a superior form of Se supplement because it behaves like amino acids and can be naturally absorbed and integrated into animal proteins, allowing animals to build a Se reserve, which can be readily available in stress condition or pass it onto their offspring and eggs - allows higher Se and antioxidant status in young animals. Recognizing these differences emphasizes the importance of choosing the most suitable Sr source for optimal animal health and performance.

Figure 1: Metabolism of selenium



Poultry

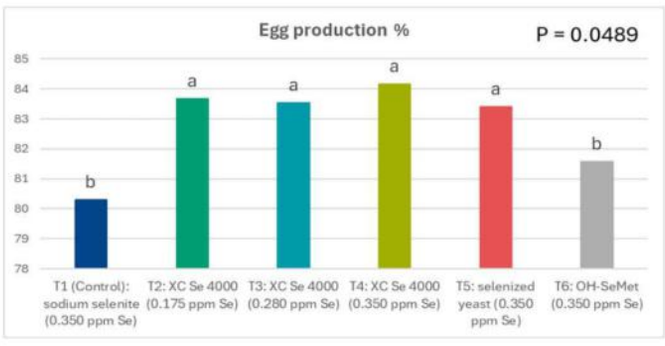
Modern poultry production relies on genetics, management, and nutrition, with Se as an essential trace mineral. Supplementing breeders with organic Se, especially L-SeMet, boosts reproductive success, chick growth, antioxidant activity, immunity, feed efficiency, and meat quality. L-SeMet in breeder diets raises Se levels in eggs, resulting in healthier chicks.

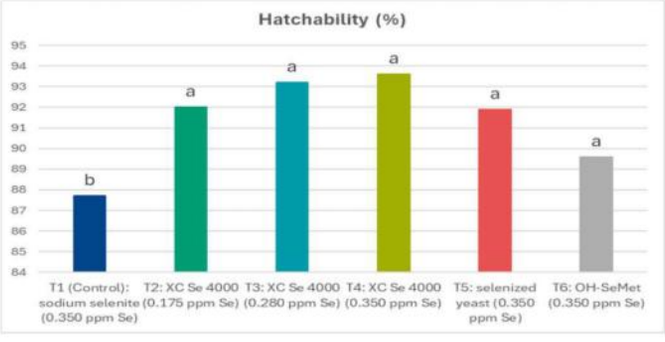
A University of Lavras trial in Brazil showed that L-SeMet (Excential Selenium 4000, Orffa Additives B.V.) improved breeder reproductive performance—raising egg production, fertility, hatchability, and sperm quality. Compared to sodium selenite, it increased selenium and antioxidant levels in eggs and day-old chicks. This 84-day trial involved Cobb 500 broiler breeders with six treatments (table below) and the following 720 chicks were monitored for antioxidant status and growth over 42 days.

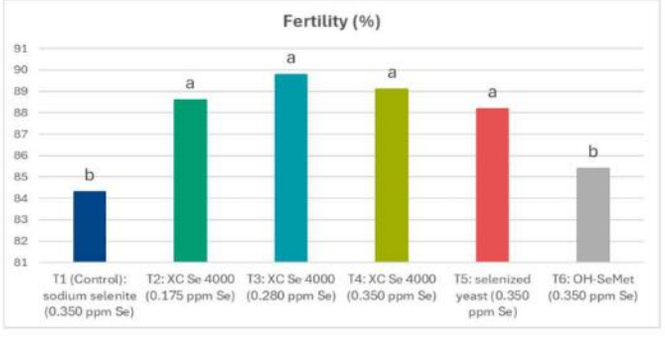
Treatments	Selenium Level (ppm)
T1: Control -	
T2: Excential Selenium 4000	0.175
T3: Excential Selenium 4000	0.280
T4: Excential Selenium 4000	0.350
T5: Selenized yeast	0.350
T6: Hydroxy-selenomethionine	0.350

Result showed female breeders fed organic Se, especially Excential Selenium 4000, boosted egg production, fertility, and hatchability more than inorganic Se. Even at lower doses, it matched the efficacy of higher selenized yeast levels (Figure 2). Male breeders on L-SeMet saw improved sperm quality. Excential Selenium 4000 enabled more Se transfer to eggs and chicks, with stronger antioxidant enzyme activities (Figure 3) and faster early growth in broiler chicks, giving them better protection and a stronger start in life.

Figure 2. Reproductive performance of female breeders. Egg production, fertility, hatchability (%)







Organic selenium is all about L-selenomethionine

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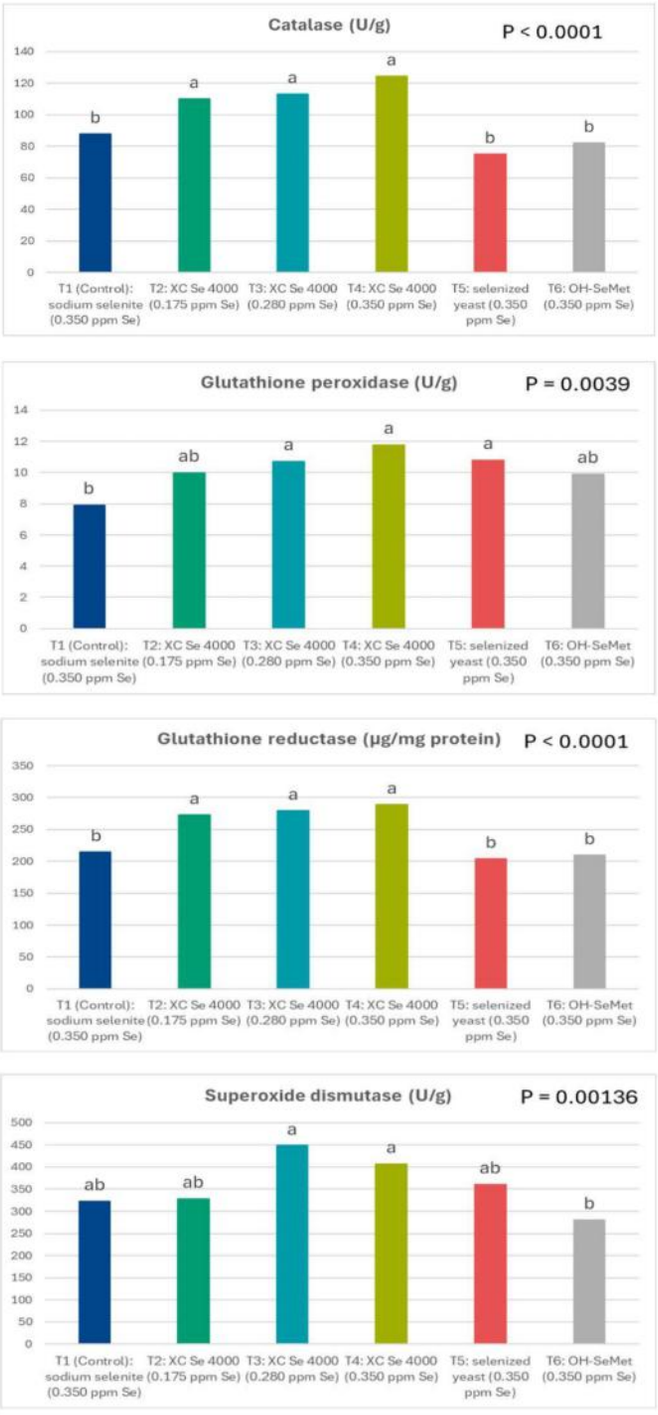
Figure 3. Antioxidative enzyme status of day-old chicks

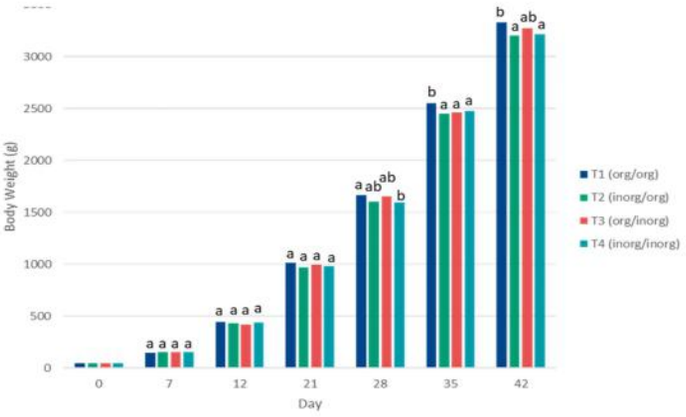


In addition, a trial at the National University of Lujan in Argentina showed L-SeMet improves broiler offspring performance. Breeders received 0.3 ppm Se from 2 different Se sources during a 10-week feeding period; eggs were then collected, and 180 chicks per treatment were divided into four groups for a 42-day grow-out, as shown in table below.

Treatment	Breeder diet (0.3 ppm Se)	Offspring diet (0.3 ppm Se)
T1: Org/Org	L-Selenomethionine	L-Selenomethionine
T2: Inorg/Org	Sodium selenite	L-Selenomethionine
T3: Org/Inorg	L-Selenomethionine	Sodium selenite
T4: Inorg/Inorg	Sodium selenite	Sodium selenite

The study found that broiler offspring from the Org/Org group had higher body weights from day 35 (Figure 4) and better meat quality, shown by reduced drip loss. European Production Efficiency Factor (EPEF) was highest in Org/Org (462) and Inorg/Org (432), while maternal L-SeMet improved efficiency to 418 for Inorg progeny; Inorg/Inorg had the lowest at 408. The form of Se given to breeders significantly affects broiler performance. Other studies on LSeMet consistently shows benefits for stress resistance and meat quality, including improved color, tenderness, and less drip loss.

Figure 4: Body weight (g) of broiler supplemented with different selenium sources

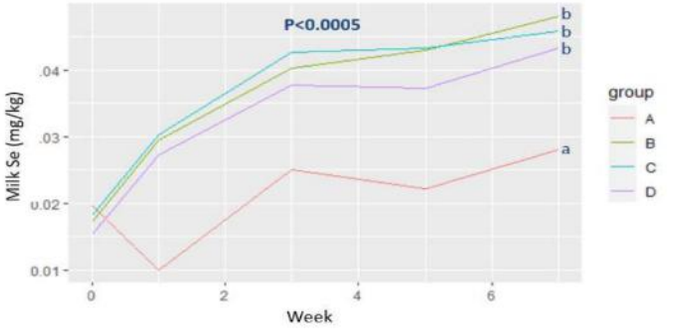


Ruminants

In dairy and beef cattle, selenium (Se) is essential for fertility, immunity, and product quality. Deficiency increases risks of retained placenta, mastitis, and weak calves. Organic Se, especially L-SeMet, enhances Se transfer to milk and colostrum, improves reproduction and calf health, supports stress resistance, and boosts oxidative stability in meat and milk. L-SeMet's storage in body protein provides ruminants with a buffer against varying Se intake, which is particularly valuable in forage-based diets.

A 2023 Scottish study found Holstein-Friesian cows fed organic Se, especially Excential Selenium 4000 and OH-SeMet, had higher milk selenium and lower somatic cell counts (SCC) than those given sodium selenite, indicating improved immunity.

Figure 5. Milk selenium (mg/kg) for each group across 7 weeks (Group: A = Sodium selenite, B = Excential Selenium 4000, C = OH-SeMet, D = Zinc-L-selenomethionine).



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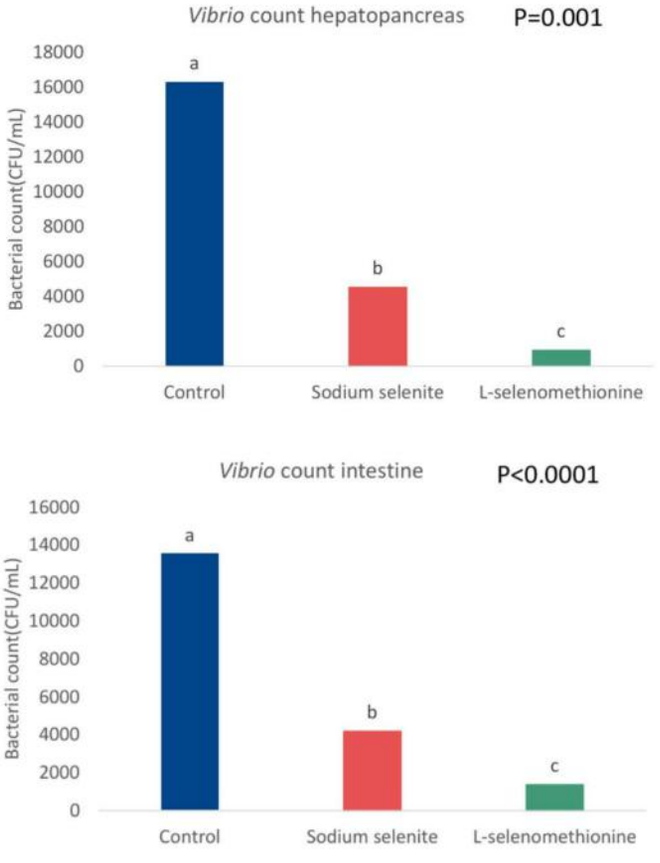
Another practical case of European dairy farm milking 110-120 cows with high comfort and hygiene standards faced issues with mastitis, dermatitis, and slow wound healing. After switching to Excential Selenium 4000 and Excential SMART C + Z (the third-generation hydroxy trace minerals by Orffa Additives B.V.), cases of dermatitis and mastitis decreased significantly, Se levels became stable across the herd, SCC improved, and antibiotic use dropped, resulting in more saleable milk.

Aquaculture

Aquacultured fish and shrimp face oxidative stress from fast metabolism and changing water conditions, making selenium vital for cell protection and immunity. Adding L-SeMet boosts antioxidants, improves growth and survival, increases fillet quality, and maintains steady tissue selenium levels.

A Kasetsart University study tested Se sources in white leg shrimp (Litopenaeus vannamei) over eight weeks, using 0.5 ppm Se either sodium selenite or Excential Selenium 4000 (LSeMet). Shrimp fed L-SeMet had the highest weight gain, most efficient feed use, fewer Vibrio bacteria (Figure 6), and the best survival rates (Figure 7) after a 15-day disease challenge. Results show organic Se, especially L-SeMet, is superior for shrimp growth and health.

Figure 6. Bacterial count after challenge with Vibrio parahaemolyticus in hepatopancreas and intestine (CFU/ml)



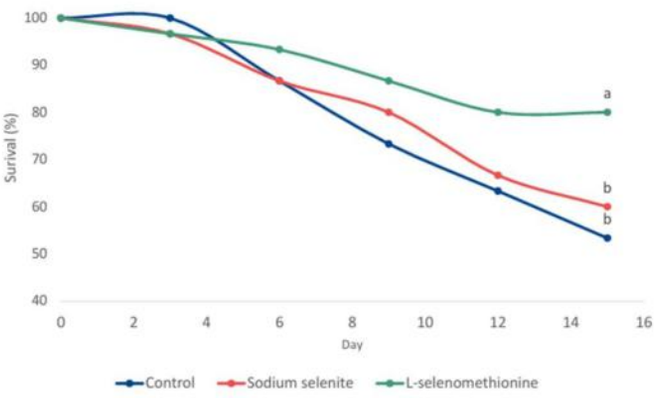


Figure 7. Survival rate after challenge with Vibrio parahaemolyticus (%)

Selenium, especially in bioavailable forms like L-SeMet, improves antioxidant protection, stress resilience, and product quality in animal production. Organic Se boosts performance and health across poultry, aquaculture, and ruminants, enhancing meat, milk, and aquatic product value. Optimizing Se nutrition promotes herd stability, reduces disease, and supports sustainable, profitable operations meeting welfare and quality standards.

Orffa Additives B.V. offer a superior organic selenium source which contain 100% Se in the most bioavailable L-Selenomethionine form. Excential Selenium 4000 contains 4000 ppm L-Selenomethionine or 1600 ppm Selenium. Excential Selenium 7500 contains 7500 ppm L-Selenomethionine or 3000 ppm Selenium.

Reference available upon request

Jolien van Soest - Global Solution Manager - Mineral Nutrition

Sopaphan Pruekvimolphan - Technical Manager - APAC

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Glamac International Pvt. Ltd.

Hosts Successful Annual Meeting 2025-2026 in Munnar, Kerala

Glamac International Private Limited, a leading name in the Poultry Nutrition Industry in India, successfully concluded its Annual Meeting for the fiscal year 2025-2026. Held from April 9th to April 12th, 2026, at the Sterling **Resorts, Munnar.** The event brought together company's all top executives, sales & operation leaders, and technical experts from India, Nepal, and Bangladesh to review the performance, unveil new products, and outline strategic goals for the upcoming year.

- The meeting featured comprehensive sessions on the company's performance, future strategies, and key innovations. Among the highlights were the much-anticipated **"Way Forward 2026-2027"**insight delivered by Managing Director **Mr. Abir Mukherjee**, followed by **Forey into international business** - Conducted by **Mr. Shobit Kumar Sahu**, International Business Manager. The most interactive part of the meeting was VAP, our recently launched sensational product developed through SenMu Taiwan for "Viral Defence" as feed additive and water-soluble powder presented by **Dr. Sumon Nag Chowdhury**, AGM-Technical and Marketing. **Mr. Dinesh Kumar Singh** Corporate Trainer Farmall Nutriconnect LLp. was the guest of honour where he conducted a highly interactive sales orientation training.

The event also included **Sales Review 2025-26** by **Dr. Manish Chaurasia,** AGM -Sales & Marketing and **Dr. Sumon Nag Chowdhury**, AGM -Sales and Technical followed by**Budget2026 - 2027** led by **Mr. Sujit Jadhav**, Sr. Manager- Finance & Operations.

Recognizing Excellence: The Annual Meeting celebrated the dedication and outstanding performance of the Glamac team with a prestigious **Award Ceremony**. Notable accolades included:

- **Long Service Award:** Mr. Rohit Gulati & Mr. Prashant Jangam
- **Glamac Superstar Award FY 2025-2026:** Mr. Navnath Bankar, Area Manager -Pune
- **Crowning Achievement Award FY 2025-2026:** Mr. Sushil Aryal -Nepal & Mr. Rohit Gulati -Chandigarh
- **MD Award FY 2025-2026:** Mr. Sujit Jadhav - Sr. Manager -Finance & Operations
- **Top Performer Award FY 2025-2026:** Dr. Sumon Nag Chowdhury- AGM & Mr. Satish Nikam-Dy. Manager - Finance & Accounts
- **Management Award for Commitment & Sincerity:** Dr. Rajesh Reddy, Product Manager & Dr. Manish Chaurasia, AGM

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For more information please contact:

Glamac International Pvt. Ltd.
413, Orion Business Park, 4th Floor, Kapurbawadi
Ghodbunder Road, Thane (W)- 400610, Mumbai, India.
• www.glamac.com • Email: info@glamac.com, sumon@glamac.com
• Dr. Sumon Nag Chowdhury: +91 9051512590
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Beyond the Boardroom: The annual meet seamlessly blended business with leisure. Attendees enjoyed a spectacular **Sightseeing in Munnar Hill Station** & experienced the vibrant **Kathakali Dance** along with **Kalaripayattu show** in Munnar.

A Vision for the Future: Glamac is expanding international business and has strengthened its leadership team with the appointment of **Mr. Shobit Kumar Sahu** - International Business Manager and focused to be a 100 Cr. Company in the next three years. The Annual Meeting 2025-2026 was a resounding success, reinforcing Glamac leadership and vision for a future of sustainable growth and innovation.

"Our Annual Meeting is a testament to our commitment to innovation, collaboration, and excellence," said **Mr. Abir Mukherjee**, Managing Director of Glamac International Pvt Ltd. "As we move forward into FY 2026-2027, we remain focused on innovative products, delivering exceptional solutions and fostering global partnerships & sourcing.

BULLETIN

Glamac Strengthens Leadership with the APPOINTMENT OF Mr. Shobit Kumar Sahu as International Business Manager

Glamac International Pvt Ltd, a leading company in Poultry Nutrition, is pleased to announce the appointment of Mr. Shobit Kumar Sahu as International Business Manager. In this role, he will be instrumental in managing and growing international business and contributing to the company's growth strategy.

Mr. Sahu is a postgraduate in Marketing from Mumbai University. He combines practical industry knowledge with a clear, results-driven approach and known for driving international sales, building strong partnerships, and expanding business across emerging markets.

With a keen interest in global trade and long-term collaborations, Mr. Sahu will work closely with distributors and partners to deliver value-driven, science-backed solutions of Glamac. Focused and resilient, Mr. Sahu will strengthen Glamac global presence in contributing sustainable nutrition solution for poultry and aquaculture.

Throughout his career, Mr. Sahu has worked with some of the leading feed additives organizations in international markets. With over 8 years of experience his roles have encompassed a wide range of responsibilities across global animal nutrition market in poultry, swine, ruminant, and aquaculture sectors. One of the notable milestones in Mr. Sahu's career was his 6+ year tenure at Vinayak Ingredients, a well-recognized name in the animal nutrition industry where he was actively involved in developing and managing distributor networks, identifying new business opportunities, and building long-term relationships with key stakeholders.

During this period, he played a key role in strengthening the company's international presence, particularly across LATAM and South East Asian markets.

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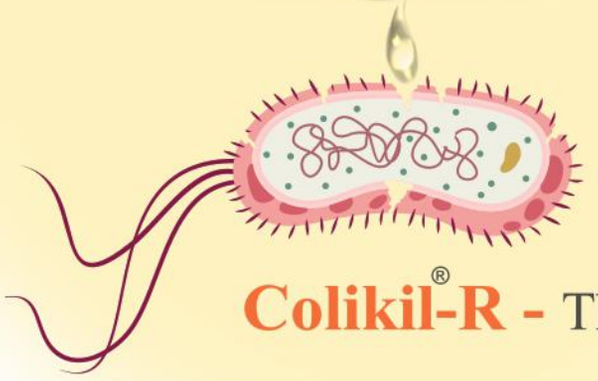

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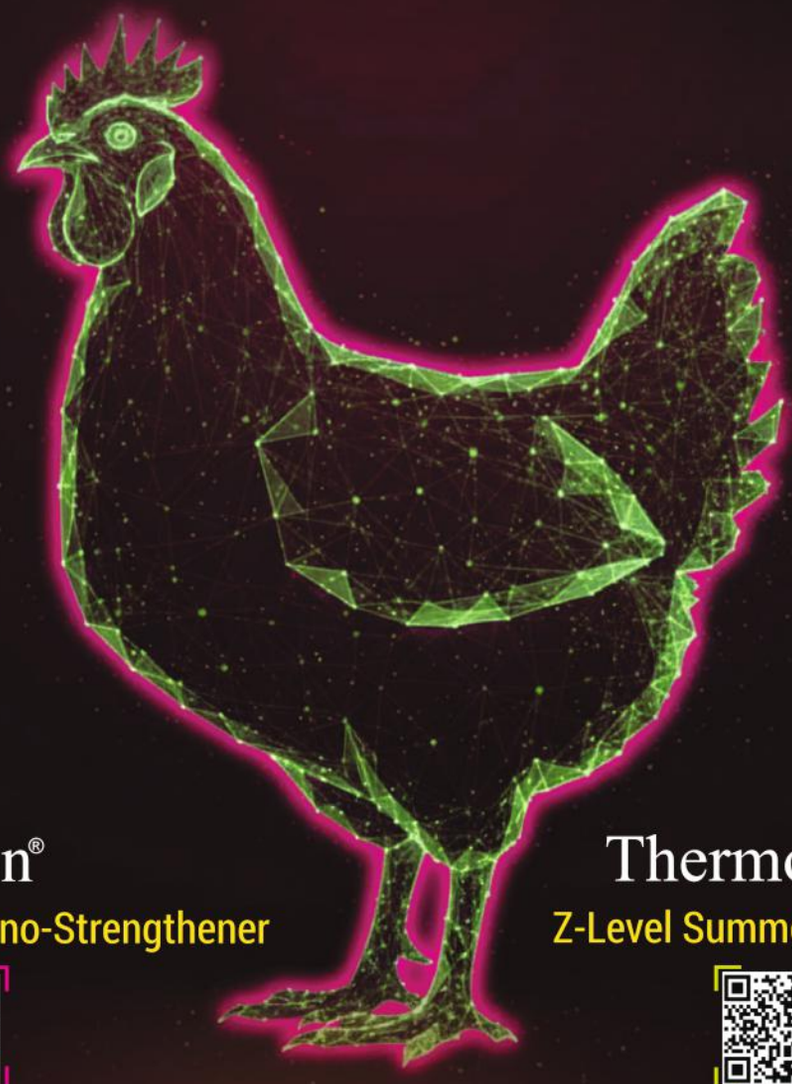

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Annual Sales Meet 2026

The Nilgiris - Where Learning Met Inspiration

From 6th to 11th April 2026, the Regen Biocorps family gathered in the misty, magical hills of **The Nilgiris** for an unforgettable Annual Sales Meet.

It wasn't just another corporate event. It was a beautiful blend of **professional growth, cultural celebration, team bonding, and breathtaking natural beauty.**

A Journey That Began with Gratitude

The excitement started in Coimbatore, where team members from across India came together, leaving behind travel tiredness and stepping into pure anticipation.

The morning began on a peaceful note with a visit to the sacred **KaramadaiRanganathaswamy Temple**- a perfect moment of calm and gratitude before the high-energy week unfolded.

Discovering the Magic of the Nilgiris

The real adventure began in the stunning Nilgiri hills:

- **Botanical Bliss:** A refreshing walk through the historic **Sim's Park** (est. 1874) in Coonoor, surrounded by vibrant flowers and towering trees.
- **Heritage on Rails:** The team experienced the iconic **Nilgiri Mountain Railway**- a UNESCO World Heritage Site. The charming toy train chugged through lush green tunnels and misty valleys from Coonoor to Ooty, creating instant smiles and beautiful memories.
- **Ripples of Joy:** With oars in hand and laughter all around, the team enjoyed a lively boating session at **Ooty Lake.** Friendly races and playful moments made it a truly memorable team-bonding experience beyond the meeting room.
- **Green Serenity:**At **Karnataka Horticulture Garden,** vibrant greenery and serene pathways offered a refreshing escape - reminding us to stay rooted as we grow.
- **A View to Remember:** At **Doddabetta Peak** (2,637 meters), the highest point in the Nilgiris, the team stood together and enjoyed a breathtaking 360° panoramic view - a powerful reminder that when we stand united, we can see much farther.
- **Roses in Full Bloom:** At **Government Rose Garden,** thousands of blooming roses across terraced slopes reflected a simple truth—success grows with patience and persistence.

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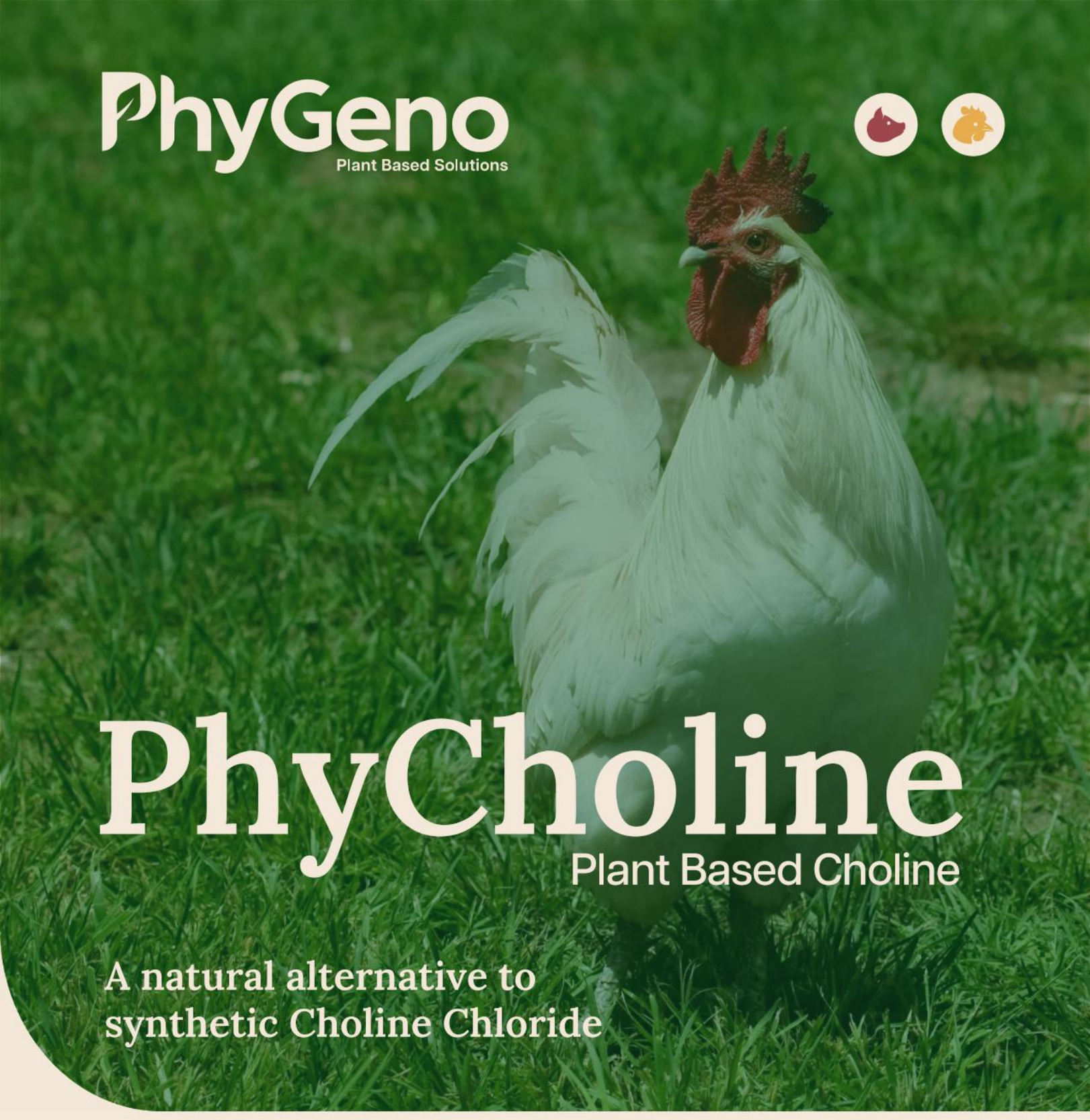

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Strategy, Culture & Celebration in Ooty

Ooty provided the perfect scenic backdrop for serious business and heartfelt celebrations.

Evenings were truly special. Under a sparkling starlit sky, the **Bonfire Oath Ceremony** brought the team together. Around the warm fire, everyone reaffirmed their targets and made strong professional commitments for the year ahead.

The cultural heart of the event shone brightly during the **Saraswati and Laxmi Poojas**. Dressed in vibrant traditional South Indian attire, the entire team welcomed our esteemed channel partner, **Mr. Chaitanya Reddy**, who gracefully lit the ceremonial lamp.

Big Moments That Defined the Meet

- **Exciting Product Launch**: Under the leadership of newly promoted **Mr. Chirag Narigara**, the team proudly launched two powerful new Aqua products - **Instabiome-NT** and **Instabiome-AM**.
- **Strategic Clarity**: In-depth sessions led by senior leadership focused on sharp sales reviews, smart marketing plans, and clear long-term growth strategies.
- **Celebrating Excellence**: Awards and promotions were given to deserving performers, proving that great results inspire even greater achievements.

Stillness, Clarity & Sales Excellence

The final days were spent at the serene **Adiyogi Isha Ashram**. An early morning group meditation at the powerful **Dhyan Lingam** brought deep peace and mental clarity to everyone.

With refreshed minds and calm energy, the team attended an inspiring **Sales Excellence Session** conducted by **Mr. Ajay Tyagi**. Rich discussions on customer engagement and professional excellence left the team motivated and aligned.

Unforgettable Fun & Camaraderie

Beyond the meetings, the spirit of Regen came alive during the spectacular **Gala Night**. Everyone dressed in traditional wedding attire, danced to an energetic DJ, and celebrated with full joy and enthusiasm.

Whether it was exploring beautiful tea factories in the gentle mountain drizzle or enjoying peaceful moments by the shimmering **Ooty Lake**, the laughter, bonding, and camaraderie were truly special.

Printed photographs were distributed throughout the week - beautiful physical memories that everyone could carry home.

Heartfelt Thanks to Our Pillars

This memorable journey was made possible because of the dedication and hard work of many:

- **Our Leadership: Mr. Pawan Kumar Mudgil (CEO)** and **Mr. Pankaj Hastwala (NSM)**- for their constant guidance, support, and clear direction.
- **Our Strong Pillars: Dr. Gopal Potdar (Marketing), Dr. Hardik Patel (Technical), Ms. Jigna Joshi (Admin), Ms. Krishna Thakkar (PMT)**- for flawless planning and perfect execution (right from traditional attire to award arrangements). Special thanks to **Dr. Amit Kumar Pandey (Export)** for his continuous support.
- **Our Backbone (Backend Ho Team):** The silent force behind every successful moment - your efforts, coordination, and commitment truly made the difference.

Carrying the Nilgiri Spirit Home

As the Regen Biocorps team returns to their respective cities, they bring back much more than just souvenirs.

They return with **renewed energy**, **stronger bonds**, **crystal-clear goals**, and a fresh wave of **inspiration**- as fresh and uplifting as the crisp Nilgiri mountain air.

Ready to conquer the year ahead - together!

#RegenBiocorps #Nilgiris2026 #OneTeamOneVision

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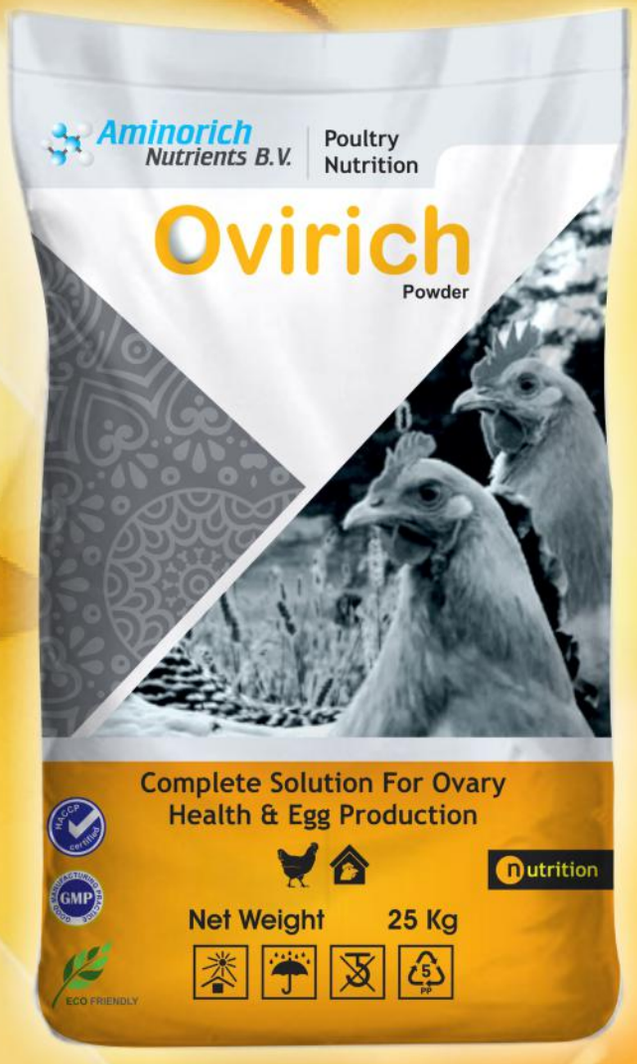

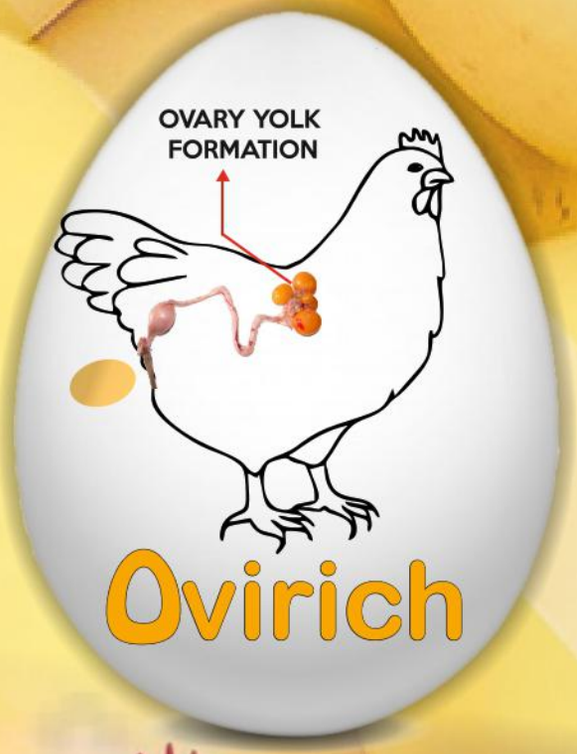

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Empowering Poultry Professionals:

Regen Biocorps' Summer Stress Management Workshops at Bhigwan & Ujjain

Regen Biocorps AHI Pvt. Ltd. successfully organized focused Summer Stress Management Workshops at Bhigwan, Maharashtra (23rdMarch 2026) and Ujjain (25thMarch 2026). The events brought together the key field force for an engaging, knowledge-driven initiative. With Indian summers growing increasingly intense, heat stress remains a major challenge affecting flock health, productivity, and profitability. The workshops aimed to equip field professionals with practical insights and scientific solutions to manage this seasonal threat effectively.

The Silent Threat: Summer Stress in Poultry

Summer stress occurs when high ambient temperatures and humidity prevent birds from dissipating body heat. Since poultry lack sweat glands, they rely on panting, which can cause respiratory alkalosis, dehydration, reduced feed intake, poor growth rates, lowered egg production, weakened immunity, and higher mortality in severe cases. These issues lead to significant economic losses through increased feed conversion ratios (FCR) and suboptimal performance.

Discussions highlighted essential farm-level management practices for effective summer stress control. An integrated approach includes housing modifications, improved ventilation, adjusted feeding and watering schedules, reduced stocking density, and targeted nutritional support. Key practices appreciated by participants were ensuring round-the-clock cool, clean drinking water, feeding during cooler hours (early morning and evening), enhancing airflow at bird level, using shade nets or evaporative cooling systems, and maintaining proper litter management.

Innovative Solutions for Summer Challenges

A key highlight of the workshops was the product presentation session, where the Regen Biocorps team introduced Thermogard as a reliable solution for managing heat & humidity stress in poultry. The **Thermogard** was explained in terms of its ability to maintain electrolyte balance, prevent dehydration, support immunity, and improve feed intake during high-temperature conditions. Alongside **Thermogard**, supporting products such as Immon, Colikil-R, Hepatotox-ES, Nephrona-U, and CRDX-IR were also discussed, showcasing their role in performance building, controlling bacterial infections, and supporting liver, kidney, and respiratory health under stress conditions, even.

Regen Biocorps AHI Pvt. Ltd. recently organized two impactful workshops in **Bhigwan** and **Ujjain** focused on managing summer heat stress in poultry farming.

Key Highlights of the Workshops

Bhigwan Session: Led by Dr. Gopal Potdar, Dr. Yeshwant Uttarwar, and Mr. Ganesh Temak, this session emphasized

field-oriented expertise, with focused technical presentations on managing summer (heat & humidity) stress in poultry farming and addressing region-specific challenges. The session was actively attended by Mr. Suhas Pawar(Vighnhar Medical), along with many other participants, makingit highly interactive and insightful.we sincerely thank him for his continued support.

Ujjain Session: Led by Dr. Hardik Patel, Mr. Sachin Kakde, and Mr. Dhananjay Singh, the team provided practical insights on heat stress identification, ventilation strategies, and flock monitoring. The session also witnessed active participation from Mr. Arshan Khan (P M Medical) and Mr. Sohel Khan (Consultant) along with many other attendees who contributed to making it highly engaging and impactful.

Both events targeted **summer stress management**, equipping key field force with actionable roadmaps to protect poultry health during hot months.The programs utilized interactive Q&A sessions and case-based discussions to ensure effective knowledge transfer and build participant confidence.

These initiatives underscore **Regen Biocorps'** commitment to sustainable poultry farming. The success of the programs was attributed to the coordination of the Regen Biocorps AHI Pvt. Ltd. team and the leadership of CEO **Mr. Pawan Kumar Mudgil** and NSM **Mr. Pankaj Hastwala**, whose vision continues to drive poultry health and productivity across India.

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Managing Synthetic Amino Acid Shortage in Poultry Feed Formulation Practical Nutritional Strategies for Maintaining Performance

Dr. Subhasish Ray, MVSc (Poultry Nutritionist)

Abstract

Global supply disruptions and price volatility of synthetic amino acids—particularly DL-methionine, lysine, and threonine—have created significant challenges for poultry nutritionists. Modern poultry diets are heavily dependent on these additives to formulate low crude protein feeds with precise amino acid balance. When supply becomes limited, nutritionists must rely more on ingredient synergy, improved digestibility, and gut health management. This article summarizes practical feed formulation strategies that can maintain bird performance and feed efficiency during periods of synthetic amino acid shortage.

Introduction

Synthetic amino acids are critical components of modern poultry feed formulation. They enable nutritionists to formulate diets with reduced crude protein while maintaining ideal amino acid ratios for optimal growth and feed efficiency. However, disruptions in global supply chains and rising production costs have resulted in shortages of key amino acids such as DL-methionine. This situation requires poultry nutritionists to adapt their formulation strategies and rely more on natural amino acid sources, enzyme technologies, and gut health optimization. **A number of the strategies to be adopted in this situation are described below which can be applied alone or in combination.**

1. Optimizing Natural Amino Acid Balance

Key Ingredient Contributions

Ingredient Key	Nutritional Contribution	Field Relevance
Soybean meal	Rich in lysine	Primary protein source
Meat & bone meal	Methionine, glycine	Improves AA balance
Fish meal	Balanced amino acid profile	High digestibility
Corn gluten meal	Methionine contributor	Useful in low SBM diets
DDGS	Sulfur amino acids + energy	Cost-effective inclusion

Field Note: Combine plant + animal proteins to reduce dependence on synthetic amino acids.

2. Moderate Increase in Crude Protein (CP)

Recommended Broiler CP Adjustment

Phase	Standard CP (%)	Adjusted CP (%) During Shortage
Starter	21–22	23–24
Grower	20–21	22–23
Finisher	18–19	20–21

Practical Insight: Increase CP by **1-1.5%** to compensate for amino acid deficiency.

3. Adjusting Ideal Amino Acid Ratios

Amino Acid Ratio Adjustment Strategy

Amino Acid	Standard Ratio (% of Lysine)	Adjusted Ratio (%)
Methionine	45–48%	42–44%
Methionine + Cysteine	72–75%	68–70%
Threonine	65–67%	63–65%

Field Application: Slight relaxation reduces cost without major performance loss.

4. Enhancing Amino Acid Digestibility

Feed Enzyme Strategy

Enzyme	Primary Function	Expected Benefit
Protease	Improves protein breakdown	↑ AA digestibility
Xylanase	Breaks fiber, releases trapped nutrients	↑ energy & AA availability
Phytase (high dose)	Improves P & AA utilization	↓ nutrient wastage
Multi-NSP enzymes	Improves overall digestibility	Better FCR

Expected Gain:+2-4% improvement in amino acid availability

5. Alternative Protein Sources

Recommended Inclusion Levels

Ingredient	Inclusion (%)	Nutritional Benefit
DDGS	5-12%	Sulfur AA + energy
Sunflower meal	5-8%	Methionine support
Rapeseed meal	4-6%	Protein + sulfur AA
Corn gluten mea	l2-4%	Methionine rich

Strategy: Diversify protein matrix to reduce reliance on synthetic AA.

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6. Gut Health Protection Strategy

Additive-Based Gut Stabilization

Additive	Function	Field Benefit
Bacillus probiotics	Enhance protein digestion	↓ undigested protein
Organic acids	Control pathogens	Better gut pH
Butyrate	Improves intestinal integrity	↑ absorption
Yeast derivatives	Immune modulation	Stress resistance

Critical Point: High CP diets → risk of **wet litter & dysbiosis** → must control gut health.

7. Energy Density Adjustment

Parameter	Recommendation
Oil addition	+0.5-1%
Purpose	Maintain energy:protein ratio
Additional benefit	Reduces heat stress impact

Field Tip: Essential in Indian summer conditions.

8. Integrated Field Strategy

Area	Action
Protein level	Increase CP by 1-1.5%
Ingredient strategy	Use mixed protein sources
Amino acid ratios	Slight relaxation
Enzymes	Add protease + NSP + phytase
Gut health	Use probiotics + acids
Energy	Increase oil level

Conclusion

Synthetic amino acid shortages require a **shift from precision supplementation to biological optimization:**

- Focus on **digestible nutrient utilization**
- Use **ingredient synergy**
- Maintain **gut integrity**
- Balance **economics with performance**

Key Principle:

"Maximize natural nutrient efficiency rather than relying solely on synthetic amino acid precision."

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Driving Alignment, Inspiring Action

Setting the Tone for the Year Ahead

In a dynamic and purpose-driven gathering, Optima Life sciences convened its three-day Annual Sales Acceleration Summit, commencing with a Town Hall on Day 1 that united cross-functional teams, leadership, and frontline stakeholders to align vision, strengthen collaboration, and accelerate execution.

The Town Hall created a unified platform to integrate perspectives across sales, marketing, technical, and operations teams—driving clarity on priorities and reinforcing a cohesive growth strategy in a competitive global landscape.

Moments that Shaped the Narrative:

- **Unified Strategic Direction:** Leadership outlined a clear roadmap focused on expansion, innovation, and long-term value creation.
- **From Insight to Impact:** Immersive exposure to the manufacturing plant and CARE facility (Center for Animal Research and Excellence) offered sales team a first-hand understanding of product science, quality systems, and research rigor—transforming knowledge into conviction.
- **Sharpening the Edge of Execution:** Portfolio deep-dives strengthened positioning, differentiation, and customer engagement strategies.
- **Mastering Crucial Conversations:** Teams were equipped to handle high-stakes interactions with precision and assurance.
- **Culture of Collaboration:** Strong cross-functional participation reinforced a unified, performance-driven organization.

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Follow Us On

The Leadership Perspective:

Mr. Vinay Kulkarni, Executive Chairman, reflected on the organization's forward momentum: *"These three days symbolize the way we envision growth—not as isolated efforts, but as a continuum of alignment, capability-building, and decisive execution. Our strategic roadmap is driven by purposeful expansion, calibrated acquisitions, and a deep commitment to innovation. As we look ahead, it is this integrated strength of our teams that will enable us to scale with clarity and confidence."*

Dr. Arindam, VP - Strategy, Marketing, *Technology*, highlighted the evolving nature of competitive advantage: *"In today's landscape, differentiation is no longer optional—it is essential.* **The next phase of growth will not be driven by products alone, but by how intelligently we position them in the market. Our focus is to move from transactional selling to insight-led engagement—where we solve problems, shape customer thinking, and create long-term value. This requires a sharper integration of science, strategy, and storytelling."**

Dr. C.V Chandrasekaran, VP-Business Development, highlighted the critical role of execution: *"In the end, strategy finds its meaning in execution. Our focus is on equipping our teams with the clarity, confidence, and capability to handle every customer interaction—especially the most crucial ones—with precision and impact."*

As the meet concluded, it left behind a renewed sense of alignment and momentum—an organization not only aligned in strategy, but elevated in capability and united in purpose. Optima Life sciences moves forward with strengthened conviction, ready to translate insight into action and ambition into achievement.

Team OPTIMA

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Asia's Agrifood Industry Leaders

Gather in Bangkok for the Opening of VICTAM Asia, Health & Nutrition Asia, GRAPAS Asia and Horti & Agri Asia 2026

Asia's agrifood industry leaders convened today at BITEC Bangkok for the opening of VICTAM Asia 2026, Health & Nutrition Asia 2026,GRAPAS Asia and Horti & Agri Asia 2026, one of the region's most comprehensive platforms connecting animal feed, nutrition, processing technology, animal health, and modern agriculture under one roof. Taking place from 10-12 March 2026, the co-located exhibitions reflect the full agrifood ecosystem as producers across Asia accelerate efforts toward greater efficiency, biosecurity, and sustainable production. Bringing together international exhibitors, technology innovators, and industry professionals from across Asia and beyond, the events highlight the rapid transformation of the sector and the growing demand for innovation across the region's food production systems.

The Opening Ceremony was officially inaugurated by a representative from **Mr. Udom Chuachan**,Deputy Director General of Department of Livestock Development, alongside industry leaders including **Mr. Jeroen van Hooff**, CEO & President of Royal Dutch Jaarbeurs; **Mr. Sebas van den Ende**, General Manager of VICTAM International; and **Mr. Salanroj Sutaschuto**, Senior Vice President of the Thailand Convention and Exhibition Bureau (TCEB). Together, the four exhibitions present the entire agrifood value chain in one visit—from feed production and animal health to crop cultivation and smart farming—bringing hundreds of international exhibitors, expert-led conferences, and thousands of professionals together to explore innovations and partnerships shaping the future of food and agriculture across Asia.

Health & Nutrition Asia 2026 Highlights

Health & Nutrition Asia 2026 returns to Bangkok as one of Asia's leading platforms for animal health, feed, and nutrition innovation, bringing together over 300 international exhibitors across 9,000 square meters and welcoming an expected 9,000 industry professionals from across Asia and beyond. The event connects global suppliers, technology providers, and buyers across the livestock, aquaculture, and animal nutrition industries, showcasing the latest solutions in feed ingredients, veterinary products, diagnostics, and smart farm technologies.

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Under the theme "Shaping the Future of Animal Feed and Health through Sustainability & Innovation," the exhibition features over 150 expert speakers and more than 30 free conference sessions addressing key industry priorities including biosecurity, disease control, sustainable production, advanced farm technologies, and precision animal nutrition across poultry, swine, aquaculture, beef, and dairy sectors. Ahead of the exhibition, the Aquatic Conference—co-organised by VIV Worldwide and International Aquafeed—takes place on 9 March at BITEC (MR 214), focusing on key developments and opportunities in aquaculture.

"Health & Nutrition Asia is designed to create meaningful industry connections by bringing together experts, solution providers, and decision-makers in one focused environment. By combining global expertise in nutrition, feed technology, and animal health, the event drives innovation, cross-border collaboration, and partnerships that support sustainable animal production and secure food supply for a growing world."- Jeroen van Hooff, CEO, Royal Dutch Jaarbeurs and VNU Group

VICTAM Asia 2026 Highlights

With more than 300 international suppliers and strong participation from key markets across Southeast Asia, VICTAM Asia 2026 remains the region's most established platform dedicated exclusively to feed and grain processing technology. Taking place in Bangkok, the event brings together technology suppliers, engineers, mill operators, and industry decision-makers from across the global feed and grain industries.

The exhibition showcases a comprehensive range of technologies covering the entire feed production process, including grinding, pelleting, extrusion, conditioning, batching, automation, and plant optimisation solutions. Visitors can explore innovations designed to improve operational efficiency, product consistency, sustainability, and production performance within modern feed manufacturing facilities.

Supported by its Themed Days programme, VICTAM Asia 2026 offers focused content tailored to specific industry segments. Each exhibition day highlights a key sector within the feed and grain value chain, including Feed Milling, Flour & Rice Milling, and Pet and Aquafeed production. Through curated visitor routes, guided show floor tours, and sector-focused networking opportunities, the programme helps visitors navigate the exhibition efficiently and connect directly with technologies and suppliers most relevant to their operations.

As Sebas van den Ende, General Manager of VICTAM explains: "This year's event once again brings the animal feed industry across Asia together. At VICTAM, our mission is not just to unite the industry, but to drive real progress. With 300 exhibitors, themed exhibition days, and targeted trade missions from across Asia, we connect visitors directly with the suppliers that truly matter. Quality remains at the heart of VICTAM. In content, connections, and sustainable business outcomes.". Supported by its Themed Days program and focused industry missions, VICTAM Asia 2026 becomes a setting where progress is not only discussed, but actively shaped.

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GRAPAS Asia 2026 Highlights

Alongside VICTAM Asia, GRAPAS Asia 2026 serves as the specialised platform for grain handling, rice milling and flour processing technologies in Southeast Asia, bringing together international suppliers and regional milling professionals shaping the future of grain processing.

A key feature of the exhibition is the Flour & Rice Miller's Lounge, a dedicated meeting space for milling professionals and decision-makers to connect with technology suppliers and exchange insights with peers. The lounge is supported by Perendale Publishers, strengthening the link with the global flour and rice milling community.

As Yvonne Kaal, Event Manager of VICTAM & GRAPAS Asia, explains: "GRAPAS Asia has become a strategic pillar within our international platform. As grain and rice processing continue to professionalise across Southeast Asia, the industry requires a clearly defined and specialised meeting place. With GRAPAS Asia 2026, we are reinforcing that position and providing focused visibility for suppliers and decision-makers shaping the region's grain sector."

Horti & Agri Asia 2026 Highlights

Horti & Agri Asia 2026 complements the platform by showcasing the latest innovations in modern agriculture, smart farming, and horticulture technologies. Leading companies including Speedy Access, TrolMaster, Aqua Control, Clearwater, and Van Iperen International present solutions ranging from greenhouse technologies and irrigation systems to fertilizers and advanced farming equipment. The exhibition highlights key segments such as farming technologies and equipment (38%), seeding and soil solutions (29%), greenhouse technologies (14%), irrigation systems (9%), and plant protection and disease diagnostics (9%), reflecting the evolving needs of sustainable agriculture. Across the three show days, visitors can explore conference sessions and the Hub of Flowers showcase, while new features for 2026 include the debut of the DEPA "Digital Durian" Pavilion, a Wolffia cultivation demonstration, and a special preview of the Udon Thani International Horticultural Expo 2026, reinforcing the event's role in advancing innovation and collaboration in Southeast Asia's horticulture and agriculture sectors.

Together, VICTAM Asia, Health & Nutrition Asia, GRAPAS Asia and Horti & Agri Asia highlight the growing importance of Asia in shaping the future of global food production. By bringing together international innovators, policymakers, researchers, and industry leaders, the exhibitions reinforce the region's role as a key hub for advancing sustainable agriculture, strengthening animal health systems, and driving innovation across the entire agrifood value chain.

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ARTICLE

Brooding: Management of Poultry Chicks

Shashi Pal[1], Hemant Kumar[2], T.K.S.Rao[3] and Rajesh Kumar[4]

Care of chicks just after hatching of eggs either by hen or by artificial means is called brooding. For proper development of poultry chicks, care of newly hatched chicks is essential. In early phase of life of chicks thermoregulatory system is not fully developed and their development takes about 2-3 weeks or even more. Therefore, it cannot maintain or regulate the body temperature properly during their early life.

Brooding of chicks

Two types of brooding of chicks:

a) **Natural Brooding:** care of chicks by broody hen and for small number of chicks.

b) **Artificial Brooding:** care of chicks by poultry farmers or any person and it is well suited for large number of chicks on commercial basis.

In natural brooding process, hen brood the chicks in which she provides heat or warmth to the chicks by covering them under her feathers. She also cares the chicks during the natural brooding process. During this natural brooding process, a broody hen cares a small number of chicks (around 10-12 chicks), and so that natural brooding is not sufficient to care a large number of chicks in commercial poultry farming systems.

In artificial brooding process, artificial heat or warmth generating systems called artificial brooder is required. An artificial brooder may be of different types like wooden, charcoal, kerosene stove, electrical, infra-red light and gas brooders. In this brooding process, care of chicks may be taken either by poultry farmers or any person and it is well suited for rearing of large number of chicks on commercial basis.

Management of chicks immediately after hatch is an art which starts before arrival of chicks at farm and end with 2-3 weeks of age in commercial broilers. Management of chicks during brooding includes space requirement for chicks, bedding materials, heat sources, watering systems, feeding systems, light systems and ventilation etc.

Depending on weather, care and management of chicks during brooding time may vary. It is easier during summer season but it is more difficult task during winter season. In summer season, the environmental temperature is high and so brooder house temperature is also high and much artificial heating means is not required. In North India, the cold weather (winter season) is much harsher due to low environmental temperature and it goes down below 4°C. There are changes in brooder house temperature and if brooder's house temperature is too low which may cause piling of chicks. Due to low environmental as well as brooder house temperature, the management of chicks is very crucial and needed proper care during cold weather or winter season.

Requirements for brooding of chicks

Space and temperature for brooding chicks: In deep litter poultry housing system, as a thumb rule, space and temperature requirements for brooding chicks are as below:

Age (weeks)	No. of Chick/ bird (nos.)	Space (sq.ft.)	Temperature (°F)
1	4	1	95
2	3	1	90
3	2	1	85
4	1	1	80
5	1	1.25	75

Preparation of Brooder House:

Brooder house should be ready well before the arrival of chicks. All materials like all equipments, bedding materials are used in previous flock should be removed from the house, scrubbed and cleaned at least one week in advance the arrival of chicks. Clean all the equipments with detergents. After the cleaning of the equipments follow the sun dried. Sun is very good a natural disinfectant for equipments. Disinfect the clean equipments with the suitable solution of disinfectant. Brooder house should be properly cleaned and allowed to dry out thoroughly. Curtains of brooder house should be clean with detergent and followed by dipping it overnight in disinfectant solution then put it for sun dry.

Fumigation must be done for proper killing of germs in the brooder house. Normally for the fumigation of poultry houses, take a two part of formalin and one part of potassium permanganate (40 ml : 20 gm) mixed together which generate the fume is sufficient to disinfect 100 cubic feet space. Proper care should be follow during fumigation of the poultry houses because the fume of $KMnO_4$ and Formalin is dangerous.

Materials are used in deep litter system for rearing of chicks are called bedding materials. Bedding materials are like paddy husk, wood savings, ground maize cob, chopped straw and saw dust etc. Mostly the bedding materials are selected based on the local availability and least cost price. It should be dried and free from fungal spores. During winter, spread the bedding materials to a depth of 2-4 inches for better insulation. During the first few days, simple paper or news paper may spread on bedding materials for easy feeding to the chicks and it also helps in leaning of feeding of chicks. Sufficient quantity (2-3%) of feeder and waterer should be placed in the brooder house prior the arrival of chicks.

Brooder or heat generating systems should be switched ON at least 16-24 hours before the chick arrival which may depend on climate. Adjust the brooder house temperature to 95°F (35°C) during the first week and it should be taken as 3-4 inches above the litter or at chick body height. The temperature is reduced by 5°F each week until it reaches 75-80°F. Too low or too high brooder temperature will adversely affect the growth performance of birds which results in poor performance and lowering the farm return. The chicks' growth performance is an indicator of a brooder house temperature. At low brooder temperature, chicks will huddle below or around the heat source (brooder), but when the brooder temperature is high the chicks will try to keep away from the heat source. If the brooder temperature is adequate, the chicks are being distributed uniformly and more active.

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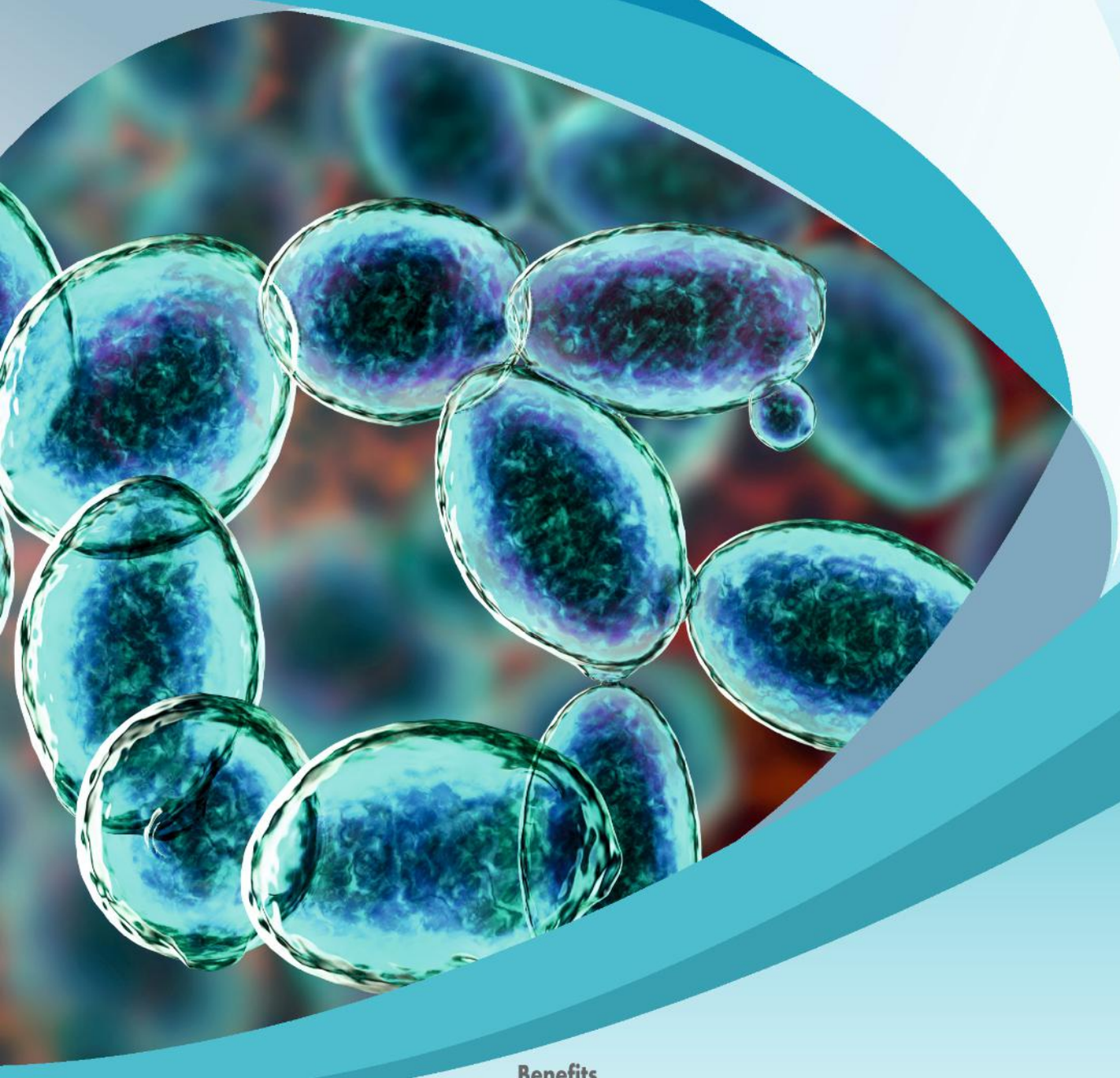

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Distribution of Chicks as per Brooder Temperature

Heating sources are followed as given below:

a) Coal or charcoal brooder

b) Wooden or saw dust brooder

c) Liquid fuel or kerosene brooder

d) LPG brooder

e) Electric brooder

f) Infra red brooder

g) Reflectors

Electric Brooder *Gas Brooder* *Saw dust Brooder*

1. **Litter Management**: Bedding material is a critical and very important input in poultry farming especially for deep litter housing system of chicken production. Litter is developed or builds up in poultry farm when poultry excreta spilled feed, feathers and other materials mixed with bedding materials. Birds are exposed to the bedding material/litter from the first day of life. If birds are managed on poor litter quality is a great source of certain infectious diseases, and may cause dampness and affects the quality air. A good litter management at broiler farm provides good comfort to the birds which reduces infectious diseases, dampness and foul air in the farm and improves the performance of broiler chicken resulting in good economic return to the farmers.

A) The bases for choosing or selecting good litter materials have the ability to protect birds from damp, dirt and cold floor. It should also have the ability to adequately conserve heat and absorb moisture. A good litter material should provide comfort for birds and for good production performance. Bedding or litter materials are usually used at rates ranging from 4-5 kg per square meter. The choice of such materials should be made based on the availability in the local area, relative advantages and disadvantages of each material under particular area and farm conditions. There are several types of bedding materials used at broiler farms i.e. Rice hulls/ husk, Hardwood shavings/ saw dust, Sand, Chopped straw, Peanut hulls and Processed paper/ paper etc.

B) Farmers can check litter quality on their experience and which is used during winter season on the basis of characteristics of litter. Litter must be fresh, locally and economically available, have low level of moisture and absorbs moisture quickly from droppings, moisture holding capacity, least tendency to form cakes. It should not be too much dried because excess dryness of litter causes more dustiness.

Rice Husk

Note: A thumb rule for quality check of litter moisture content, it is tested by pressing a hand full of litter tightly. If it adheres slightly or breaks up when hand is open, it indicates proper moisture content in litter and so that it is good litter material for bedding. When hand is open and if the litter material will form a ball in the hand, it indicates that litter material have high moisture content. Ideally, litter moisture content should be maintained below 25 percent.

2. **Feed Management**: Birds need feed for the daily nutritional requirement for the body development, normal physiological activities and to maintain body temperature. The changes in environmental temperature influence the variation in feed consumption of birds with each degree change in temperature. At low environment temperature, the feed consumption of bird is more because bird requires extra energy to maintain body temperature. In winter, number of feeders should be increased as compared to summer. Feed should be available to the bird whole day.

3. **Water Management**: During winter season water requirement of bird is less due to low environmental temperature. To increase the water intake of bird, it is necessary to give continuous supply of fresh and clean water which is warmer than tank store water. If tank water is too cold, it should not be given to birds without adding hot water. It is good for birds when drinking water must be offered as clean and fresh water. Salt, amyron and jaggery etc. may be added in water to improve the water intake of the birds.

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Factors Influencing Feed-enzyme Stability for Poultry

By Anna Fickler, Arne Solbak, Roland Staff

Exogenous feed enzymes are commonly used in commercial monogastric diets to enhance the nutrient and energy digestibility of the diets by reducing the impact of anti-nutritional factors and/or releasing additional nutrients.

Often, only performance and digestibility studies are considered important to prove the benefit of dietary enzymes in poultry and other animals. Many of these studies use freshly produced product samples that were stored under optimal conditions. However, less focus is put on the commercial conditions that impact enzyme stability during storage, premixing and pelleting.

In many countries, humid and hot climate conditions can lead to loss of activity in enzyme products, especially if storage under ambient conditions is not consistently possible.

In addition, enzymes are sensitive to pH and temperature during application and have specific optima for these parameters. If the pH or temperature is too extreme, the enzymes can become inactive, reducing or eliminating their effectiveness in breaking down feed components.

Moreover, not all enzyme molecules can withstand the acidic conditions in the stomachs of monogastric animals, thereby losing activity before they can hydrolyze the antinutritional factors.

If the animals do not receive the intended enzyme dose with their feed due to the factors mentioned above, or if the enzyme is not optimally adapted to the gastrointestinal conditions of the animal, it can lead to inconsistent or even negative effects on animal performance.

Fundamental understanding

Selecting an effective feed enzyme requires a fundamental understanding of protein structure, function and stability when exploring enzyme diversity and how these attributes can enhance application efficacy.

Generally, enzymes are illustrated as complex static molecules. However, this is far from the truth because they are dynamic structures that have tremendous movement and are regarded as stable if in a balanced energy equilibrium.

External forces such as temperature, harsh pH conditions and oxidative stress can disrupt the equilibrium, leading to perturbations that unfold the protein structure and result in a loss of biological function. Therefore, selecting the right feed enzyme requires consideration of both in vivo studies and product characteristics, such as the overall stability of the product and its fit to the conditions within the animal's gastrointestinal tract (GIT).

Additionally, it's important to remember that enzymes are not delivered “as is” to the customers; they are formulated together with carriers or formulation aids into final solid or liquid products that can be added to the feed production process.

Understanding enzyme stability

The stability of an enzyme is based on the sequence of the amino acids and their interaction with other surrounding amino acids. Amino acids have different functional groups that enable the polymer to fold into secondary structures such as α-helixes and β-sheets, as well as unstructured free loops (Figure 1).

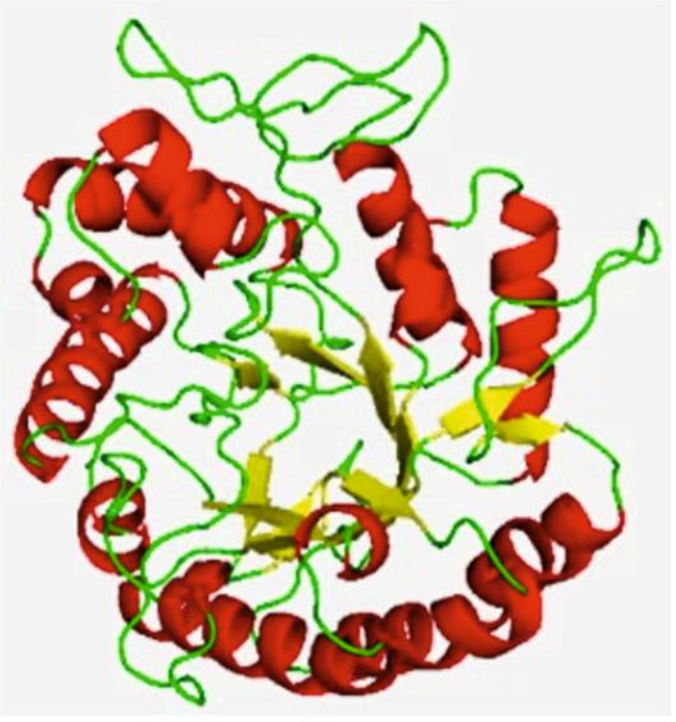

Figure 1. α-helixes are the red ribbons and β-sheets are the yellow arrow ribbons; the unstructured free loops are in green.

Finally, the tertiary structure of the enzyme is the combination of the secondary structures, based again on the intramolecular forces within the amino acid polymer, salt linkages, hydrogen bonding, disulfide linkages, hydrophobic interactions and Van der Waals' forces, resulting in the functional enzyme. If these complex structures are permanently changed, the enzyme may lose its activity and function.

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One main factor changing the enzyme structure, and thus stability, is temperature. Temperature triggers the movement of molecules. With increasing temperatures, they move faster, which can lead to permanent structural changes. Designing an enzyme in a way that it has a rigid structure is therefore beneficial for its thermal stability. However, at the same time, enough flexibility in amino acid chains constituting the enzyme needs to be ensured, as enzymes often need to slightly rearrange themselves when delivering their function.

In nature, enzymes have evolved over the last 4 billion years. Ancestral sequences have shown that protein stability has changed over eons.

For example, during hotter eras, flexible loops between secondary structures evolved to be shorter to maintain structural rigidity compared to cooler eras, when these loops were extended to enable more plasticity in protein structure to enhance functional activity. When it comes to nature and industrial enzymes, there is a fine line between protein rigidity for stability and protein plasticity for functional activity. In the BASF lab, using directed evolution, thermal-stabilizing mutations are tested for activity in the intended application to ensure that performance is not compromised.

The activity of the enzyme is based on amino acids in the active site that can draw in the substrate, catalyze the biochemical reaction and then remove the newly formed substances to allow the reaction to repeat. The activity is enhanced by the flexibility of the active site pocket (area of the enzyme into which the substrate binds). This flexibility can be influenced by temperature and pH. In addition, pH can change the charge and shape of the substrate and affect the protein kinase A of the catalytic amino acids to enable functionality.

Several factors determine an enzyme's gastric stability, including its resistance to both pH changes and proteolytic degradation. Thermostable enzymes (natural or evolved) often demonstrate gastric/acidic pH stability as well as enhanced shelf-life stability. This suggests that these different external forces may have a similar impact on the properly folded enzyme.

In addition, it is hypothesized that naturally or evolved thermophile enzymes tend to be more protease-stable than mesophile enzymes because the protein structures are more compact. This is due to the stronger intramolecular forces in thermophile enzymes that prevent the protease from accessing the amino acid polymers easily and initiating their degradation.

As mentioned earlier, enzymes are usually not sold as pure molecules but are rather embedded in formulations. The chemical nature of the formulation aids is also important as they can influence the effectiveness of the enzyme — negatively or positively.

For example, metal ions can help stabilize the three-dimensional enzyme structure and thus increase thermostability. On a larger scale in particular, solid formulations reduce the mobility of the amino acid chains and thus also increase stability.

In these situations, different particle sizes can impact the stability differently. Usually, larger particles (or granules) allow for higher enzyme stability than smaller, powder-like particles. In addition, it can make a difference if an enzyme is embedded in a particle or is present only on its surface.

Also, the formulation — the way it is prepared and its constituents — determines many important application parameters such as flowability, dustiness and tendency to cake. As BASF has formulation expertise from many different fields, these general application parameters and feed-specific ones can be considered and applied to existing and new products such as Natupulse®TS.

Thermostability of enzymes

Roughly 50% of the total volume of feed for poultry and pigs worldwide is pelleted. Pelleting can prevent the separation of feed ingredients, improve starch digestibility and increase the animals' energy consumption. In addition, some compound-feed producers use very high pelleting temperatures to reduce the microbial load (e.g., Salmonella) in the feed. High pelleting temperatures are a challenge for enzymes and other feed additives.

On the one hand, a feed enzyme should be most efficient under the body temperature of monogastric animals (~ 38° C to 41° C or 100.4° F to 105.8° F). On the other hand, it should withstand high pelleting temperatures of 85° C (185° F) and above.

This wide temperature range often cannot be covered by a molecule. If an enzyme is not heat-stable, the free energy within the molecule increases with increased temperatures, reaching a point where the enzyme will lose its secondary features. This results in a collapse of the tertiary structure and, thus, loss of enzyme activity.

Several techniques can be applied to avoid activity losses during pelleting. Granulation can, to a certain degree, protect the enzyme from denaturation at high pelleting temperatures. Furthermore, enzymes can be applied as liquid formulations via a post-pelleting liquid-application system.

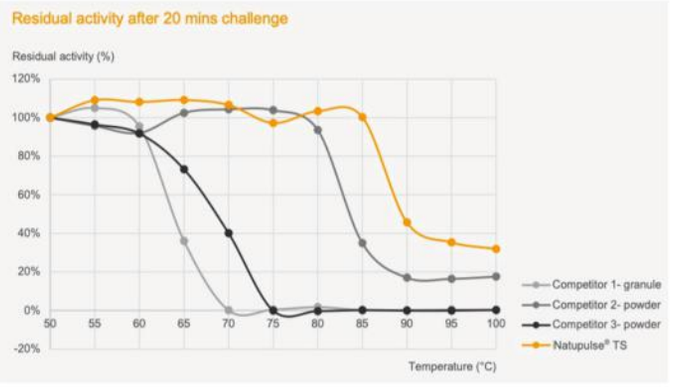

Figure 2. Heat challenge. Enzymes were diluted and heat-challenged at the desired temperature for 20 minutes. The heat-challenged samples were cooled down and assayed at 50° C (122° F) in a DNS mannanase activity assay. Relative activity was calculated by comparing it to a 50° C reference.

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Thus, the part of the pelleting process with high temperatures is bypassed. However, some enzymes can even retain their activity at high pelleting temperatures without granulation. These enzymes are intrinsically thermostable, either by nature or by directed evolution in the lab.

For a better understanding of the thermostability of an enzyme at high temperatures, a temperature challenge test can be conducted in vitro. In this test, the enzyme is exposed to different temperatures for 20 minutes. This evaluation does not reflect commercial pelleting processes but gives an indication that an enzyme can withstand challenging temperatures.

BASF tested Natupulse TS under these conditions in comparison to three established competitor products (one granule, and two powder formulations) on the market (Figure 2). Investigators analyzed the relative activity of all enzymes after 20 minutes at temperatures between 50° C and 95° C (122° F and 203°), with a stepwise increase of 5° C (41° F), respectively.

Two out of three competitor products showed a greater loss in activity already at temperatures above 65° C and 70° C (149° F and 158° F), respectively. At 85° C (185° F), only Natupulse TS was able to retain most of its activity. Even after 20 minutes at 90° C (194° F), almost 50% of the activity of Natupulse TS remained, showing a superior thermostability in this test.

The intrinsic thermal stability of a molecule often indicates rather low degradation during storage. Accordingly, one can estimate that such high thermostability compared to other mannanases will also lead to good shelf-life stability.

Shelf-life stability

After the production of an enzyme product, a slow aging process starts decreasing enzyme activity. This process is influenced by the intrinsic stability of the enzyme, its formulations, the packaging of the product and the storage conditions.

Natupulse TS has a shelf life of 24 months when stored at or below 20° C (68° F). BASF guarantees this shelf life based on extensive testing with miniature versions of the original packaging, consisting of a bag-in-box system. The packaging material was selected to allow both excellent protection and easy use by the customer.

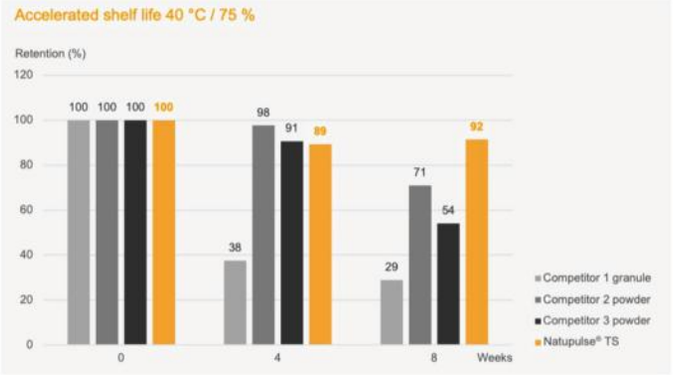

Figure 3. Accelerated shelf-life test. Enzymes were stored for 8 weeks at 40° C (104° F) and 75% humidity. Retained enzyme activity was analyzed at 4 and 9 weeks, respectively.

Careful design of logistics ensures that the enzyme's activity is maintained through transports and that the customer receives a product that fulfills defined quality requirements. After arrival at the customer, cooled storage might not always be possible.

Depending on the climate, temperature and especially humidity can be high, accelerating enzyme degradation. To consider different climate conditions, BASF conducted various stability tests at different moisture and temperature levels to evaluate the performance of Natupulse TS, e.g., under so-called challenging conditions such as 40° C (104° F) and 75% humidity.

Natupulse TS was tested under these challenging conditions over 8 weeks compared to other mannanase products available on the market (Figure 3). The following graph shows that a loss in activity occurred from day 0 to week 4 for all mannanase products. However, after 8 weeks, no additional losses occurred for Natupulse TS, and its activity remained stable.

Compared to other mannanase products evaluated in this test, Natupulse TS showed superior stability after 8 weeks when stored under challenging conditions. This correlates well with the results of the pelleting stability and is caused by the enzyme's inherently high thermostability. Additionally, the formulation design and packaging protect the enzyme from degradation.

Premix-stability test

Premixes are composed of manifold additives that are usually included in the feed in minor amounts. Some premixes contain vitamins, (trace) minerals, amino acids, choline chloride and enzymes, among other additives.

Some of these additives are chemically quite aggressive and can modify the enzyme molecule, for example, by perturbing the hydrogen bonds and Van der Waals' forces, either by oxidation or even by breaking the main amino acid chain (hydrolysis) or disulfide bonds that add to the tertiary enzyme structure.

In addition to the chemically challenging environment, the same thermostability factors as with shelf life also play a role in premix stability. However, in contrast to shelf life, higher temperatures will accelerate chemical reactions in a premix even more.

Prior to being added to the feed, premixes are usually stored for weeks or even months. Therefore, the stability of the enzyme in premixes is paramount and normally ensured by specific formulation.

Granulation of the enzyme can be a technique to improve enzyme stability in premixes because the outer layer of the granule protects the enzyme from direct contact with vitamins and minerals. However, some enzyme molecules have higher stability toward chemical changes; thus, a granulated formulation is not needed.

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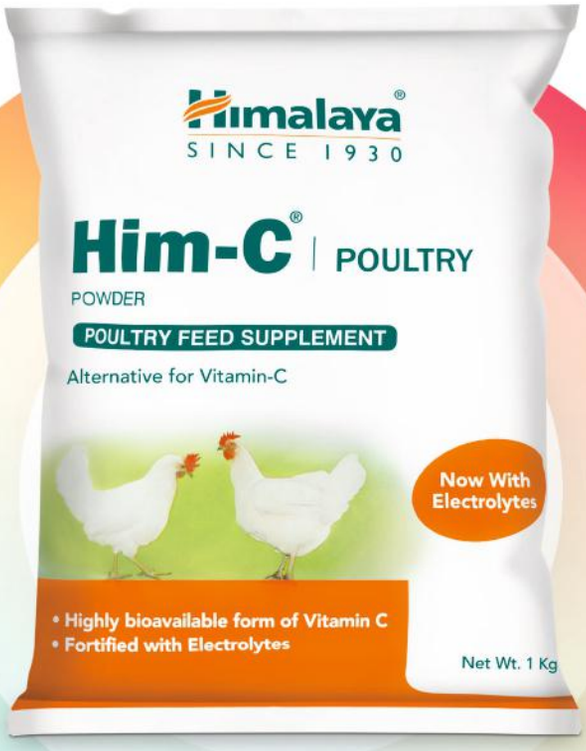

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Tulsi
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Guduchi
Antioxidant and immunomodulator

Triphala
Antioxidant, scavenges free radicals, and protects the cells and digestive system

*Creative Visualization

Benefits:

- Helps to maintain metabolic profile for better body function
- Helps to cope with various stressors
- Helps to cope with temperature-related stress
- Helps to improve eggshell quality
- Helps to improve fertility and hatchability during summer/ heat stress in breeder birds

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As with the shelf-life test, BASF evaluated the stability of Natupulse TS in premixes under challenging conditions (40° C/104° F and 75% humidity) versus other mannanase products (Figure 4).

The test was conducted over 8 weeks. After 8 weeks, only one competitive product showed a similar stability as Natupulse TS. The other mannanase products had lost more of their enzyme activity, one of them up to 78% compared to the activity on day 0.

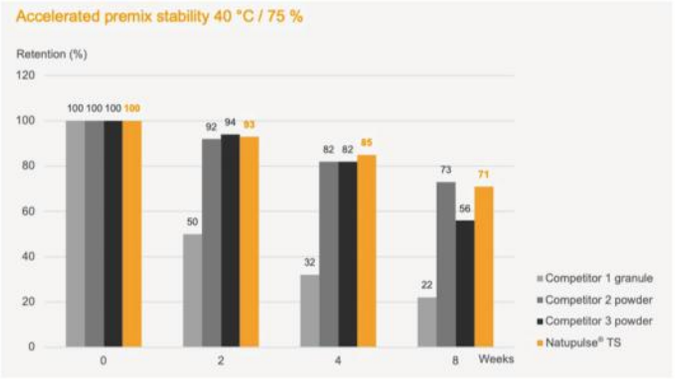

Figure 4. Accelerated premix stability test. Enzymes were stored for 8 weeks at 40° C (104° F) and 75% humidity in a commercial premix. Retained enzyme activity was analyzed at 2, 4 and 8 weeks.

Gastric stability and pH profile

For feed enzymes, the desired attributes are high efficacy on the substrate of interest with a broad pH profile and high intrinsic-protein stability. Gastric stability is important for feed enzymes because it helps ensure that the enzymes remain active until they reach their target site in the digestive tract.

Most feed enzymes such as phytase, xylanase and mannanase need to eliminate the effect of anti-nutritional factors. For that, feed enzymes need to be active already at the beginning of the GIT in an acidic environment.

The pH range of a feed enzyme is important because it affects the enzyme's activity and efficiency. Enzyme activity is highest within a specific range of pH values, known as the enzyme's optimal pH range. If the pH is outside of this range, the enzyme's activity and efficiency can be significantly reduced.

As previously mentioned, feed enzymes should be active directly at the beginning of the GIT to hydrolyze anti-nutritional factors and reduce their potential negative effects on the diet's nutrient digestibility and nutrient absorption. In monogastric animals like poultry and pigs, the pH at the beginning of the GIT is usually between 2 and 6. Thus, a feed enzyme should ideally act under a wide pH range between pH 2 and pH 6.

Investigators also evaluated the pH range of Natupulse TS and mannanase products on the market (Figure 5). Natupulse TS has a pH range from pH 2 to pH 6 and thus is very well adapted to the pH range of the GIT of monogastric animals.

To be active at the beginning of the GIT, the enzyme needs to be available. This can be challenging in granule formulations that are fat-coated because these granules often do not dissolve fast enough. In these situations, the powder formulation of Natupulse TS is advantageous because the enzyme molecule dissolves very fast under GIT conditions and thus enables a high efficacy (Figure 6).

Conclusion

BASF developed Natupulse TS, an intrinsically stable mannanase, for the feed-additive market. The results confirm that this stability has an advantage in pelleting, shelf life, premix and gastric stability. In addition, the broad pH range will enable the enzyme to be active and stable in the digestive tract where it is eventually degraded by the animal's proteolytic enzymes.

By Anna Fickler, PhD,
Global Technical Product Manager, BASF SE
Arne Solbak, Senior Scientist
BASF Enzymes LLC
Roland Staff, PhD,
Team Lead Formulation Feed Enzymes, BASF SE

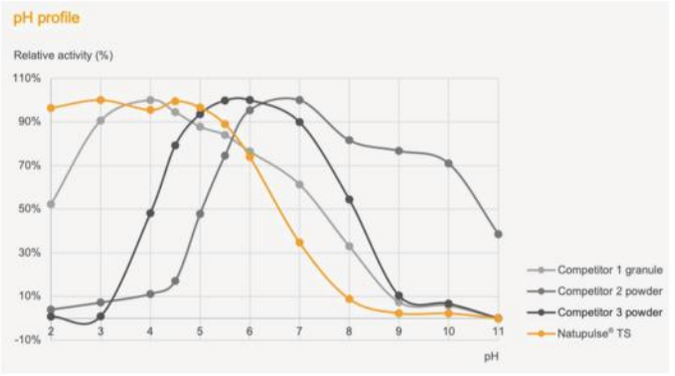

Figure 5. pH activity test. Extracted enzymes were diluted in H2O. Britton-Robinson buffer pH 2 to pH 11 was used. Samples were analyzed with a DNS assay at 50° C (122° F). Relative activity was calculated by comparing it to the maximal activity for each enzyme.

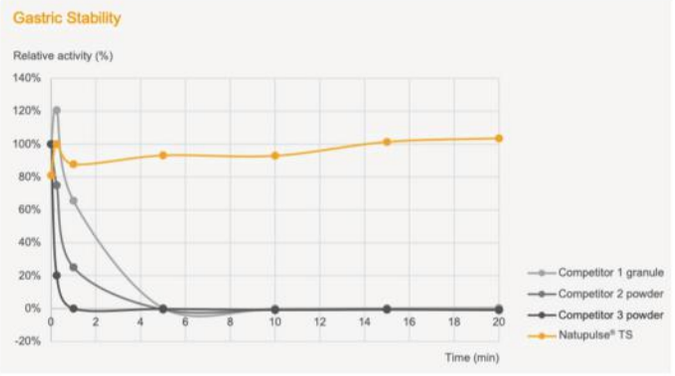

Figure 6. Simulated gastric stability test at pH 2 with pepsin and 37° C (98.6° F) reaction temperature. Samples were taken at desired time points and run with a DNS activity assay.

OPTIMA LIFE SCIENCES
HOSTS SCIENTIFIC CONCLAVE IN RAJAHMUNDRY

Optima Life Sciences successfully organized a high-impact scientific conclave in Rajahmundry, bringing together poultry customers and veterinary professionals to explore the critical role of intestinal health in enhancing layer productivity. The conclave was held at Shelton Hotel and witnessed active participation from key stakeholders across the poultry industry.

The session commenced with a warm welcome note by Dr. CVC (Vice President, Sales, Optima Life Sciences Pvt. Ltd.), who introduced Optima Life Sciences and presented an overview of the company's advanced manufacturing capabilities and dedicated research farm. Attendees gained valuable insights into Optima's strong focus on innovation, quality, and research-driven solutions for modern poultry production.

The highlight of the conclave was an in-depth technical session delivered by eminent poultry expert Dr. U. C. Patel (Freelance Poultry Consultant | 31+ Years of Experience | South Asia, Middle East & Africa). He provided a comprehensive understanding of gut health challenges in layers, emphasizing that intestinal health is dynamic and continuously evolves across different phases of the layer lifecycle. During the pullet stage, the gut prepares for the onset of lay, while during peak production, the intestine undergoes constant physiological stress and wear, often compromising nutrient absorption efficiency.

Dr. Patel further highlighted that three fundamental pillars of gut health are crucial for sustaining layer performance—gut microbiota, gut integrity, and gut immunity. He elaborated on how any imbalance in these pillars directly impacts nutrient utilization, health status, and overall productivity. He also emphasized the importance of maintaining a healthy intestinal environment, discussed the significance of medullary bone as a vital calcium reservoir for eggshell formation, and explained key factors affecting nutrient absorption, including microbial balance and intestinal morphology. The importance of probiotics in maintaining gut stability and resilience was also underlined.

A key scientific insight shared during the session was the role of tributyrins as an efficient energy source for intestinal epithelial cells (villi). Healthy and well-developed villi play a crucial role in maximizing nutrient absorption, ultimately translating into improved production performance.

The conclave concluded with a presentation by Dr. Kalyani (Senior Product Manager, Optima Life Sciences Pvt. Ltd.), who introduced ButyEster Pro 3, an advanced gut health solution developed by Optima Life Sciences. She highlighted how the product supports intestinal villi development and regeneration, promotes beneficial microflora balance, and enhances overall gut functionality. She further emphasized that all three critical pillars of gut health—microbiota, integrity, and immunity—are effectively addressed by ButyEster Pro 3, enabling birds to achieve and sustain peak production levels.

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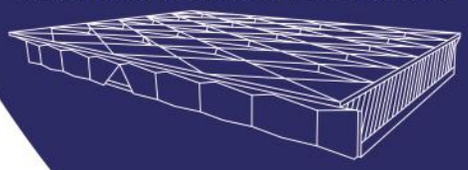

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The event witnessed enthusiastic engagement and meaningful discussions, reflecting the industry's growing recognition of gut health as a key driver of productivity and profitability in layer farming. Optima Life Sciences continues to lead with science-backed innovations aimed at addressing evolving challenges in poultry production.

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animal-nutrition.basf.com

Uttar Pradesh Poultry Conclave 2026

Concludes as a Grand Success "Poultry to Progress" Drives Growth, Sustainability & Rural Empowerment

The Uttar Pradesh Poultry Conclave 2026, jointly hosted by the Department of Animal Husbandry, Government of Uttar Pradesh, and supported by IPEMA - Poultry India, concluded on a highly successful note at Indira Gandhi Pratishthan, Lucknow.

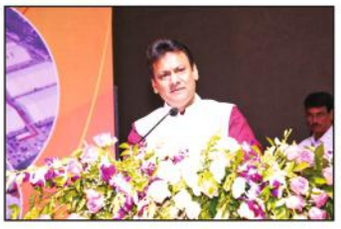
Centered around the theme "Poultry to Progress," the two-day conclave brought together over 2500+ participants including policymakers, industry leaders, entrepreneurs, scientists, veterinarians, and farmers—marking a strong step forward for the poultry and animal husbandry sector in the state.

The conclave commenced with the ceremonial lamp lighting in the presence of esteemed dignitaries including Prof. S. P. Singh Baghel, Hon'ble Union Minister of State; Shri Dharampal Singh, Hon'ble Minister for Animal Husbandry & Dairy Development; and Shri Dinesh Pratap Singh, Hon'ble Minister for Horticulture & Food Processing.

Led by Uday Singh Bayas, President, IPEMA - Poultry India, the association played a key role in strengthening industry collaboration and knowledge exchange throughout the conclave.

Leadership Insights & Vision

In his address, Uday Singh Bayas highlighted the immense growth potential of India's poultry sector, emphasizing its role in nutrition security, rural employment, and economic development. He acknowledged the Government of Uttar Pradesh and the leadership of Hon'ble Chief Minister Yogi Adityanath for advancing agriculture and allied sectors.



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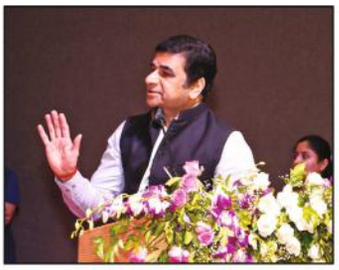

He showcased the global scale of Poultry India Expo, with over 50,000 visitors, participation from 50+ countries, and 500+ exhibitors, reinforcing its position as South Asia's leading poultry platform. He also advocated for wider inclusion of eggs ("Pakshiphal") in welfare programs to address malnutrition and emphasized the sector's strong CAGR growth trajectory.

Prof. S. P. Singh Baghel, in his keynote address, provided a candid and forward-looking perspective, stressing the need for sustained industry engagement and mindset transformation to unlock Uttar Pradesh's full potential in poultry. He highlighted the importance of backyard poultry in driving rural employment and women empowerment, while emphasizing scientific awareness, research, and innovation to address challenges such as feed costs and disease management.

Key Highlights of the Conclave

- Inaugural sessions featuring senior government leadership and industry stakeholders
- Technical sessions on market linkages, financing, policy support, and backyard poultry
- Focus on rural empowerment, skill development, and entrepreneurship
- Investors' Summit highlighting emerging opportunities in the poultry sector
- Sessions on sustainability, poultry waste management, and antibiotic-free production
- Book release showcasing success stories of poultry entrepreneurs
- Recognition of progressive farmers and sector contributors

A major highlight was the Curtain Raiser of the 18th edition of Poultry India Expo 2026, officially opened by Chief Guest Prof. S. P. Singh Baghel. The announcement, led by President Uday Singh Bayas along with industry leaders, marked a significant milestone for the sector.

Industry Impact & Outcomes

The conclave fostered meaningful discussions, valuable connections, and a clear direction for future growth. With strong participation and engagement, it reinforced Uttar Pradesh's emergence as a key poultry growth hub.

The sessions emphasized integrated approaches covering disease management, nutrition, innovation, sustainability, and digital adoption—strengthening the roadmap for long-term sectoral development.

IPEMA - Poultry India remains proud to collaborate with the Department of Animal Husbandry, Government of Uttar Pradesh, in driving this impactful initiative.

Conclusion

The successful conclusion of the Uttar Pradesh Poultry Conclave 2026 reflects the collective commitment of government and industry to accelerate growth, innovation, and sustainability in the poultry sector.

Invitation

IPEMA - Poultry India invites all stakeholders, industry leaders, entrepreneurs, and farmers to participate in the 18th edition of Poultry India Expo 2026, scheduled from November 25-27, 2026, with Poultry Knowledge Day on November 24.

Join us in shaping the future of poultry and driving progress across India.





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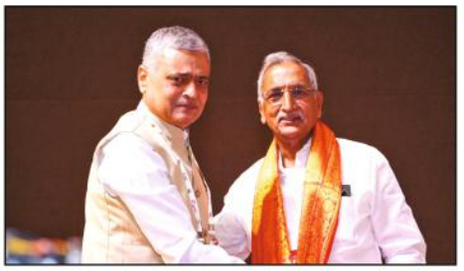


Progress



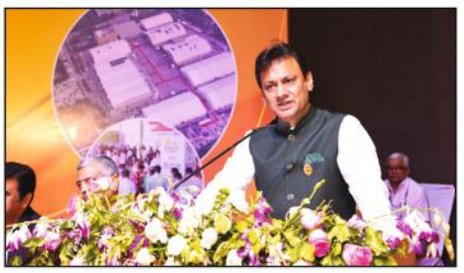
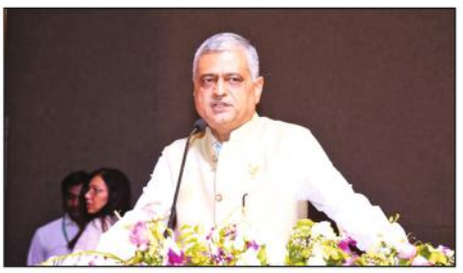


INDIAN POULTRY EQUIPMENT MANUFACTURERS ASSOCIATION - MEMBERS


The First Poultry Conclave of State, Uttar Pradesh
Poultry to Progress

The First Poultry Conclave of State, Uttar Pradesh
Poultry to Progress

15th 16th
The First Poultry Conclave of State, Uttar Pradesh
Poultry to Progress



ARTICLE

Thermal Stress and Metabolic Dysfunction in Poultry Systems

[1]Dr.Sayyed Mushtaque and [2]Dr. Akash Wadal

Introduction:

Metabolic disorders in poultry refer to pathological disruptions across critical metabolic pathways, such as energy homeostasis (e.g., dysregulated carbohydrate metabolism), lipid dynamics (e.g., hepatic lipidosis syndromes), protein catabolism (e.g., muscular atrophy), mineral homeostasis (e.g., ionic disequilibria), and acid-base equilibrium (e.g., alkalotic states from respiratory compensation). Summer conditions exacerbate these issues through extreme ambient heat (>30–35°C) coupled with high relative humidity, which compromises thermoregulatory efficiency. Avian species, devoid of sweat glands, depend on panting for evaporative heat loss; however, humidity impedes this mechanism, inducing sustained heat stress. Consequently, birds experience neuroendocrine activation (e.g., hypercortisolemia), anorexia, reactive oxygen species accumulation, and maladaptive nutrient shifts, precipitating acute metabolic derangements.

The financial repercussions are profound, manifesting as annual global losses exceeding hundreds of millions of dollars from retarded growth (20–30% deficits), curtailed egg yield (10–25% in layers), heightened lethality (5–10% increments), and inferior carcass attributes (e.g., PSE-like meat defects)

Physiology

Stage	Trigger	Response	Consequence
1	High temp/humidity	No sweat glands	Hyperthermia
2	Excess heat	Panting, less feed	↓ Nutrients
3	Heat persistence	↑ Corticosterone	Protein breakdown
4	Water loss	Respiratory alkalosis	Acid-base imbalance
5	High temp	↑ ROS production	Cell damage
6	Poor gut blood flow	Leaky gut	Toxins in blood
7	Gut damage	Poor absorption	Poor growth
8	O□ shortage	↑ Glycolysis	Low ATP
9	ROS damage	Mitochondrial failure	Energy crisis
10	All above	Combined stress	Mortality ↑

Heat Stress Effects

Heat stress in poultry triggers profound physiological disruptions, starting with impaired thermoregulation characterized by hyperpnea/panting, hypophagia (20-40% feed intake reduction), and excessive evaporative water loss, leading to dehydration, retarded growth, and nephropathology. Endocrine responses amplify this via hypercorticosteronemia, reactive oxygen species (ROS) generation, and enterocyte tight junction breakdown, while metabolic dysregulation from enteral hypoperfusion promotes anaerobic glycolysis and mitochondrial ROS overload, culminating in nutrient malabsorption, ATP deficiency, and lactic acidosis; interventions include evaporative cooling, enhanced ventilation, electrolyte supplementation (Na^+, K^+, Ca^{2+}, P), corticosterone modulators, antioxidants like vitamin E/Se, probiotics, and metabolizable energy optimization.

Pathological cascades extend to acid-base imbalance with hypocapnia-driven respiratory alkalosis (pH >7.45) and HCO_3^- depletion causing eggshell thinning, hypocalcemia, and neuromuscular tetany (treatable by $NaHCO_3$ repletion), alongside oxidative pathology from lipid peroxidation, protein carbonylation, and mitochondrial apoptosis that induces lymphoid atrophy, phagocyte dysfunction, and immunosuppression (countered by selenomethionine and osmolyte protectants). Hepatic lipotoxicity via lipogenic enzyme upregulation (ACC/FAS) leads to fatty liver hemorrhagic syndrome (FLHS), rupture, and hemorrhagic diathesis, while protein/energy shifts fuel proteolysis for gluconeogenesis/glycogenolysis with anaerobic ATP reliance, causing 10-20% pectoralis muscle atrophy (addressed by crystalline amino acids and glycemic stabilizers); microbiome dysbiosis promotes Clostridium pathobionts, short-chain fatty acid (SCFA) decline, enteritis, endotoxemia, and poor FCR, mitigated by multi-strain probiotics and prebiotic

Broiler vs. Layer Heat Stress Impacts

Poultry Type	Key Vulnerabilities	Production Impacts	Mortality Risk
Broilers	Rapid growth, high metabolism	30-40% feed drop, poor FCR, 15-20% breast yield loss, PSE meat	High (sudden deaths)
Layers	Continuous egg production	20-50% egg drop, thin shells, FLHS, poor hatchability	Moderate (liver rupture)
Breeders	Reproductive demands	Fertility ↓, embryonic mortality, chick quality issues	Moderate-high
Ducks/ Geese	Waterfowl tolerance	Milder; wet litter, reduced appetite	Low
Turkeys	Large body mass	Slow growth, leg weakness, panting stress	Moderate

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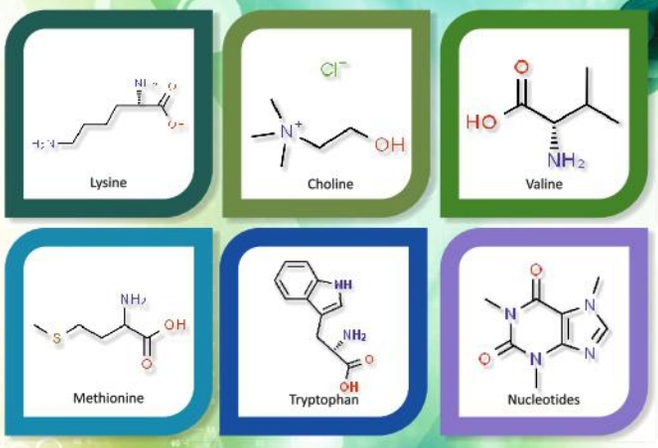

To achieve high efficiency poultry farming, a finely balanced feed formula with high bioavailability of feed nutritional fractions especially of critical ingredients including limiting amino acids, trace minerals etc., are required. To attain this balance, supplementation becomes extremely crucial to attain maximum bird performance and productivity.

Supplementation of limiting amino-acids and other related nutritional ingredients including major and trace minerals can support in improving the bird performance by assisting in providing additional nutritional molecules, to make up for any deficiency of critical nutrients in feed and feed ingredients.

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Clinical Signs & Detection

Category	On-Farm Signs	Lab/PM Indicators	FarmerTools
Behavioral	Panting, lethargy, huddling	↑ Corticosterone	THI monitoring (>72 = alert)
Production	Feed intake ↓40%, water ↑2x	Respiratory alkalosis (pH>7.45)	Daily mortality logs
Egg Quality	Shell-less/watery eggs	↓Bicarbonate, Ca	Eggshell thickness test
Carcass	Pale combs, sudden deaths	Fatty/hemorrhagic liver	Necropsy (liver exam)
Lab Markers	Wet droppings	↑ MDA, triglycerides	Water meter readings

Prevention Strategies

Effective heat stress management combines environmental control, nutrition, and monitoring tailored for Indian summer conditions. Focus on practical, cost-effective solutions for broiler and layer farms

Housing

- Ventilation: Airflow removes heat/humidity; implement 0.1-0.15 m^3/min/bird using tunnel fans.
- Evaporative Cooling: Water evaporation lowers temp 5-10°C; use pad systems (80% efficiency) or foggers.
- Shading: Blocks solar radiation; orient north-south sheds with reflective roofs.
- Stocking Density: Reduces heat buildup; limit to 8-10 birds/m^2 for broilers, 5-6 for layers.
- Night Cooling: Pre-cools house before heat peaks; run fans + open curtains post-sunset.
- Nutritional Interventions
- Electrolytes: Replaces Na^+,K^+ losses; dose 0.2% $NaHCO_3$ + 0.1% KCl in water.
- Vitamins C/E: Antioxidant protection; 200mg/kg vit C, 100mg/kg vit E.
- Selenium: ROS scavenging; 0.3 ppm in feed.
- Essential Oils: Gut protection, appetite stimulant; 200-300g/MT.
- Diet Adjustment: Lower heat increment; reduce protein 1-2%, increase fat 2-3%

Farm Practices

- Water Management: Clean nipple lines daily, 2x normal flow rate
- Probiotics: 1kg/MT during heat waves for gut stability
- Monitoring: THI logs + water:feed ratio (>3:1 = emergency)
- Emergency Protocol (THI >80):
- Electrolyte flush (3 days continuous)
- Full ventilation + pads ON
- Skip afternoon feed
- Vitamin C injection (50mg/bird)

Expected Results: 15-25% production recovery, mortality drops 50-70% with combined

[1]Dr.Sayyed Mushtaque and [2]Dr. Akash Wadal
[1]General Manager-Breeder and Hatcheries
[2]Veterinary officer Premium
Chick Feeds Pvt Ltd

EVENT CALENDER

JUNE 2026
VIV EUROPE 2026
2-4 June 2026
Venue : Jaarbeurs, Utrecht, The Netherlands
Contact Person : Ms. Natalie Taylor
Phone : +31 621 31 61 82
Email : natalie@vnueurope.com
Web : www.europe.viv.net

VIV EUROPE

JUNE 2026
28-30 JUNE – MIDDLE EAST POULTRY EXPO
Venue : Riyadh, RICEC, Saud Arabia
Phone : +966542804924 / +966114824876
Email : info@mep-expo.com
Web : www.mep-expo.com

MIDDLE EAST POULTRY EXPO

JULY 2026
13-17 JULY – WORLD'S POULTRY CONGRESS
Venue : Metro Toronto Convention Center, Toronto, Canada
Phone : +1-416-585-8120
Email : info@wpc2026toronto.com
Web : www.wpc2026toronto.com

AUGUST 2026
4-6 AUGUST – SIAVS
Venue : Anhembi District - São Paulo - Brazil - Av. Olavo Fontoura, 1209
Phone : +55 (11) 3095-3120
E-mail : siavs@abpa-br.org
Web : www.siavs.com.br

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9–10 OCTOBER - 7TH WVPA ASIA MEETING 2026
Venue : NASC, New Delhi, India
Contact Person : Dr Barman Bichitra
Phone : +91 95036-50001
Email : dr.barman@gmail.com
Web : www.wvpaasiameeting2026.com

7th WVPA ASIA MEETING 2026

NOVEMBER 2026
25-27 NOVEMBER - POULTRY EXHIBITION
Poultry India Expo 2026 | Knowledge Day - 24th Nov. 2026
Venue : HITEX Exhibition Complex, Hyderabad
Contact Person : Ms. Radhika
Phone : 7997994338/1/2
Email : office3@poultryindia.co.in, president@poultryindia.co.in
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*Majority of field trials were conducted at same farm with multiple sheds in integrations across various geographical locations and at different time of the year. Some of the integrators were generous in sharing complete production indices while others communicated the summary of the trial results. In the field trials, Improval MS was compared with antibiotic/probiotic/antibiotic + probiotic/probiotic + prebiotic control. Detailed reports availble on request.

Arm & Hammer Animal Nutrition

Appoints

Mijaj Khan
Sr. Account Manager - North India
(Poultry & Dairy Business)

Arm & Hammer Animal Nutrition is pleased to announce the appointment of Mr. Mijaj Khan as Senior Account Manager - North India (Poultry & Dairy Business), effective January 2, 2026. In this strategic role, Mijaj will spearhead key account management, customer engagement, and business expansion initiatives across North India, further strengthening the company's footprint in the Poultry and Dairy sectors.

Mijaj holds a Bachelor of Science degree and an MBA, combining strong scientific knowledge with strategic business leadership. With over 16 years of progressive experience in animal health and nutrition, he has built a distinguished career marked by consistent performance, market expansion, and long-term stakeholder partnerships.

Prior to joining Arm & Hammer, Mijaj has held key positions with leading organizations including Mankind Pharma, MSD Animal Health, Diamond V, and Elanco India Pvt. Ltd.. Across these assignments, he demonstrated strong expertise in strategic sales management, channel development, territory expansion, and key account leadership within competitive and high-growth markets.

Commenting on the appointment, Dr. Ajeet Bishnoi said:

"We are delighted to welcome Mijaj Khan to the Arm & Hammer leadership team. His extensive industry experience, customer-centric approach, and proven ability to drive sustainable growth align perfectly with our strategic objectives in North India. We are confident that his leadership will significantly enhance our Poultry and Dairy business operations."

On assuming his new responsibilities, Mijaj Khan stated:

"I am honored to join Arm & Hammer Animal Nutrition and look forward to contributing toward the company's growth journey. By strengthening customer partnerships and delivering science-backed nutritional solutions, we aim to create long-term value for the Poultry and Dairy industry in North India."

This appointment underscores Arm & Hammer Animal Nutrition's continued commitment to strengthening its leadership bench and accelerating growth through innovation, technical excellence, and customer-focused solutions in the livestock sector.

About Arm & Hammer Animal Nutrition:

Arm & Hammer Animal Nutrition, a division of Church & Dwight, is a global leader in science-based nutritional solutions for the livestock industry. The company specializes in feed additives, performance enhancers, and innovative technologies designed to improve animal health, productivity, and sustainability across poultry, dairy, and other livestock segments. With a strong focus on research, quality, and customer partnerships, Arm & Hammer Animal Nutrition delivers value-driven solutions to producers worldwide.

Physiological Adaptation to Heat Stress Targeting Metabolic and Cellular Needs in Poultry

Heat stress in poultry extends beyond an environmental challenge, characterised as a complex physiological disruption involving metabolic imbalance, oxidative stress, and organ dysfunction. While external cooling strategies help alleviate thermal load, they do not fully address the internal biological strain experienced by the bird.

Therefore, effective mitigation must align with the bird's physiological needs by supporting **cellular homeostasis, metabolic efficiency, antioxidant balance, and organ functionality**. These internal disruptions highlight that effective heat stress management must go beyond environmental control and directly address the bird's physiological and cellular requirements.

What Birds Actually Need Under Heat Stress

1. Metabolic Support at the Cellular Level

Heat stress induces profound alterations in cellular metabolism, primarily driven by reduced voluntary feed intake coupled with an increase in basal maintenance energy requirements. This creates a paradoxical situation where nutrient intake declines, but energy demand for thermoregulation and cellular homeostasis rises.

At the metabolic level, heat-stressed birds demonstrate:

- A shift in nutrient partitioning from productive functions (growth, egg synthesis) toward maintenance and survival
- Suppression of mitochondrial oxidative phosphorylation efficiency, leading to reduced ATP yield per unit substrate
- Increased reliance on glycolytic pathways, which are less energy-efficient and contribute to metabolic acidosis
- Altered endocrine responses, including elevated corticosterone, promoting protein catabolism

Mitochondria, being the central regulators of cellular energy metabolism, are particularly vulnerable to thermal stress. Heat-induced mitochondrial dysfunction leads to:

- Reduced activity of key enzymes in the tricarboxylic acid (TCA) cycle
- Impaired electron transport chain (ETC) efficiency
- Increased electron leakage, further contributing to oxidative stress

Collectively, these changes result in a negative energy balance, even when dietary formulations meet standard nutritional specifications under thermoneutral conditions.

2. Replenishment of Antioxidant Systems

Heat stress is strongly associated with the excessive production of **reactive oxygen species (ROS)**, resulting in a state of oxidative stress where the generation of free radicals exceeds the bird's intrinsic antioxidant capacity. This imbalance disrupts cellular homeostasis and is a key factor limiting performance under thermal stress.

At the cellular level, oxidative stress manifests as:

- **Lipid peroxidation**, compromising membrane integrity and fluidity
- **Protein oxidation and denaturation**, impairing enzymatic and structural functions
- **DNA damage**, affecting cell replication and viability

These changes collectively reduce cellular efficiency, particularly in metabolically active tissues ultimately impacting nutrient absorption, metabolism, and product quality.

Antioxidant Defense Systems

The avian antioxidant system comprises both **enzymatic and non-enzymatic components**, working synergistically to maintain intracellular redox balance:

Non-enzymatic antioxidants:

- **Vitamin E (α-tocopherol):** A lipid-soluble antioxidant that protects cell membranes from lipid peroxidation
- **Vitamin C (ascorbic acid):** A water-soluble antioxidant that scavenges free radicals and regenerates oxidized Vitamin E

- **Enzymatic antioxidants:**
  - **Superoxide dismutase (SOD):** Converts superoxide radicals into hydrogen peroxide
  - **Glutathione peroxidase (GPx):** Reduces hydrogen peroxide and lipid peroxides
  - **Catalase:** Decomposes hydrogen peroxide into water and oxygen

Under heat stress, the activity of these systems is often **insufficient or depleted**, necessitating targeted nutritional support.

To effectively mitigate oxidative stress, strategies should focus on strengthening both **endogenous antioxidant enzyme systems** and **exogenous antioxidant supply**:

- **Augmentation of antioxidant reserves:** Ensuring adequate availability of key antioxidants to neutralize excess ROS

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- **Regeneration of antioxidant cycles:** Supporting the recycling of oxidized antioxidants (e.g., Vitamin C regenerating Vitamin E), thereby sustaining antioxidant efficiency
- **Maintenance of intracellular redox balance:** Preventing a shift toward a pro-oxidant state that can impair metabolic and immune functions
- **Protection of high-turnover tissues:** Safeguarding intestinal mucosa and muscle cells, which are particularly vulnerable to oxidative damage during heat stress

Optimizing antioxidant status under heat stress conditions leads to:

Stabilization of cell membrane integrity

Preservation of enzyme activity and metabolic functions

Enhanced immune competence and stress resilience

Better meat quality and shelf life through reduced lipid oxidation

3. Support for Efficient Energy Pathways

Heat stress induces significant alterations in endocrine and metabolic responses, directly impacting energy utilization and nutrient efficiency. One of the primary hormonal changes includes elevated corticosterone levels, which promotes protein catabolism and diverts nutrients away from productive functions.

In addition, heat-stressed birds exhibit:

- Reduced efficiency of carbohydrate and lipid metabolism, limiting available energy
- Disruption in electrolyte balance, impairing enzyme activity and cellular functions
- Altered acid-base equilibrium, particularly due to respiratory alkalosis from panting

These changes collectively compromise the efficiency of energy generation and utilization at the cellular level.

To restore metabolic efficiency under heat stress, strategies should focus on:

- **Maintaining electrolyte and acid-base balance:** Adequate levels of Na^+, K^+, and Cl^- are essential to support enzymatic reactions and cellular homeostasis
- **Supporting energy metabolism pathways:** Enhancing the efficiency of glucose utilization and lipid oxidation to ensure sustained energy availability
- **Optimizing cellular energy transfer systems:** Supporting intracellular mechanisms involved in electron transport and ATP generation, which play a key role in maintaining metabolic efficiency under stress conditions
- **Minimizing protein catabolism:** Improving nutrient bioavailability to reduce reliance on body protein reserves for energy Heat stress can be viewed as a condition of impaired energy transfer efficiency, where nutrient utilization is compromised despite adequate dietary supply. Supporting key intracellular energy systems—particularly those involved in mitochondrial electron transport helps maintain ATP generation and overall metabolic stability.

4. Protection and Functional Support of Vital Organs

Heat stress imposes a disproportionate physiological burden on key visceral organs, primarily due to sustained metabolic strain, altered blood flow distribution, and oxidative damage. These organs play central roles in maintaining systemic homeostasis, and their functional compromise directly translates into production losses.

Hepatic function : The liver acts as the primary metabolic hub regulating carbohydrate, lipid, and protein metabolism. Under heat stress, reduced feed intake and altered lipid mobilization increase the risk of hepatic lipidosis and oxidative damage.

Support strategy: Enhancement of lipid metabolism and detoxification pathways to maintain metabolic efficiency and prevent fat accumulation.

Cardiovascular stability: Heat stress challenges circulatory efficiency, affecting oxygen delivery and nutrient transport

Support strategy: Maintenance of optimal circulatory dynamics to ensure adequate tissue perfusion and oxygenation under stress conditions.

Renal function (Kidneys): Kidneys play a critical role in electrolyte balance and osmotic regulation. Heat stress, coupled with dehydration, increases the burden on renal function.

Support strategy: Preservation of electrolyte balance and excretory efficiency to prevent metabolic disturbances.

Enhanced organ integrity and functional efficiency, results in reduced prevalence of metabolic syndromes and stress-induced pathophysiological conditions

Conclusion

When cellular metabolism, antioxidant defenses, energy pathways, and organ function are collectively supported, birds exhibit enhanced physiological stability under stress conditions. This integrated resilience not only improves survivability and livability but also enables birds to sustain performance and express their true genetic potential—even under extreme environmental and metabolic challenges.

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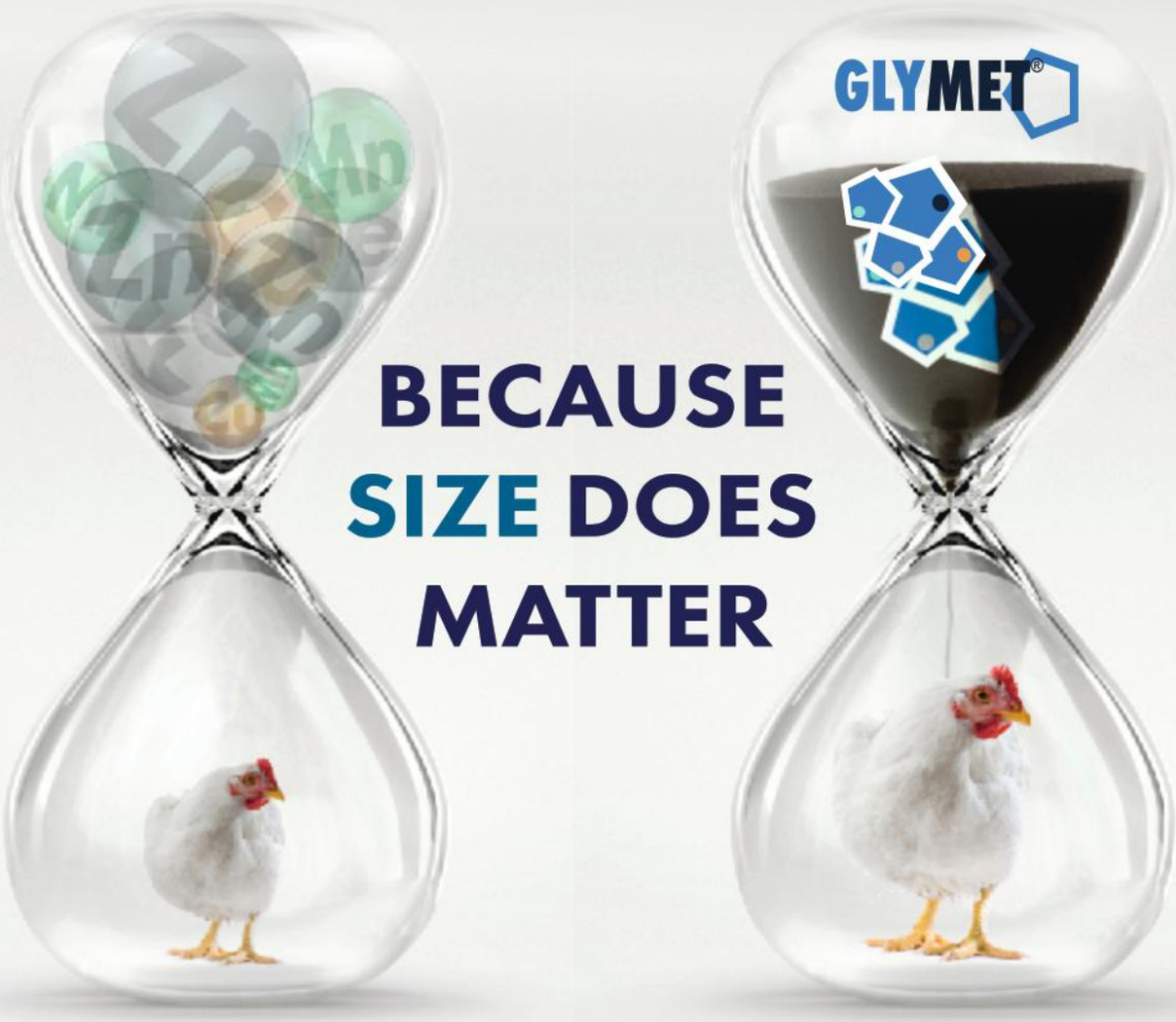

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Stallen South Asia Pvt. Ltd.

Annual Conference 2025–2026: Celebrating Excellence, Shaping Tomorrow

The Annual Conference 2025-2026 was successfully held at Vivanta by Taj, Kochi, Kerala, bringing together our sales and head office teams for three days of strategic alignment, recognition, and collaboration.

The conference commenced with an inspiring address by our Director, Mr. Aniket Parikh, who set the tone for the event with a forward-looking vision and words of motivation for the entire team. His message emphasized growth, commitment, and the opportunities that lie ahead.

A key highlight of the conference was the recognition and award ceremony, where top performers were honored with trophies and certificates. Their achievements were celebrated as a testament to dedication, excellence, and consistent performance.

The strategic direction of the organization was further strengthened through a comprehensive session by our Chief Operating Officer, Dr. Sanjay Singhal. His presentation provided an in-depth review of the past year's performance and outlined a clear, actionable roadmap for the upcoming year, aligning teams toward shared business objectives.

The second day was dedicated to technical excellence and innovation. Two intensive technical training sessions were conducted by our two Product Managers, along with the launch of five new products—three in the therapeutic segment and two in feed additives. These sessions were highly interactive, focusing on strong product positioning and equipping the sales team with in-depth technical knowledge for effective market execution.

To balance learning with engagement, the day also included fun and competitive team-building activities that energized participants and fostered stronger regional team bonding.

The conference concluded with one-on-one strategic discussions between the sales team and management. These interactions were instrumental in refining plans, setting targets, and aligning strategies for the upcoming year.

As the conference came to a close, it marked not just the end of the 2025-2026 cycle, but the beginning of a renewed commitment. The team departed with clear goals, strengthened strategies, and a shared promise—to return with flying colors and successfully achieve the targets and strategic objectives set for 2026-2027.

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Efficacy of PEPIGRO
on the performance of commercial broilers under field conditions.

Abstract

This study evaluates the efficacy of PEPIGRO, a *Bacillus licheniformis*-based probiotic and postbiotics as antimicrobial peptide (AMPs), on the growth and health performance of commercial broilers under field conditions. A total of 36,000 straight-run broiler chicks were assigned to control and treatment groups, with the latter receiving PEPIGRO supplementation at 300 g/ton of feed. The trial was conducted over 42 days during extreme heat (42–45°C), and assessed body weight, feed intake, feed conversion ratio (FCR), weekly gain, and mortality. PEPIGRO supplementation resulted in an 8.18% increase in body weight, a 6.59% rise in feed intake, and a 6.22% improvement in weekly gain compared to the control, alongside a 1.68% enhancement in FCR. Mortality was notably reduced by 28.08%, indicating improved survivability. These findings demonstrate that dietary inclusion of PEPIGRO effectively enhances broiler growth performance, feed efficiency, and health, supporting the role of *Bacillus licheniformis* as a promising antibiotic alternative under commercial field stressors.

Dr. Amit Janbandhu
(Product Manager-Nutrition)
Stallen South Asia Pvt.Ltd.

Dr. Sanjay Singhal
(Chief Operating Officer)
Stallen South Asia Pvt. Ltd.

1. Introduction

The widespread use of antibiotics in animal husbandry for growth promotion and disease control has led to serious concerns, including antibiotic resistance and environmental contamination (Tang et al., 2017). Consequently, restrictions on antibiotic growth promoters (Organization, 1999) have accelerated the search for safer alternatives. Among these, bioactive feed additives, such as probiotics, antimicrobial peptides, plant extracts, acidifiers, and essential oils—have shown potential in improving growth, immunity, oxidative balance, and gut health (Xu et al., 2021; Yi et al., 2017; Pearlin et al., 2020; Montassier et al., 2021).

Probiotics, particularly *Bacillus licheniformis*, have gained attention due to their safety and multifunctional benefits (Ningsih et al., 2023). This spore-forming bacterium enhances nutrient digestion through enzyme production, modulates gut microbiota, suppresses pathogens, and improves immune responses (Giri et al., 2019). It also produces antimicrobial compounds and enhances antioxidant activity, contributing to better intestinal integrity and performance (Jia et al., 2018; Chen and Yu, 2020).

Necrotic enteritis (NE), caused by Clostridium perfringens, is a major poultry disease causing significant economic losses (Wade and Keyburn, 2015). Probiotics like B. licheniformis have demonstrated potential in mitigating NE by improving gut barrier function, modulating immunity, and stabilizing microbiota (Wang et al., 2017; Lin et al., 2017).

2. Antimicrobial Peptides (AMPs)

Antimicrobial peptides (AMPs) are small, naturally occurring bioactive molecules found in diverse organisms and play a key role in innate immunity as a first line of defense. They exhibit broad-spectrum activity against bacteria, fungi, parasites, and viruses, contributing significantly to host protection (Huan et al., 2020).

Antibacterial Substances Produced by *Bacillus licheniformis*

The endospore-forming bacterium *Bacillus licheniformis* produces a wide range of antimicrobial compounds with diverse structural and functional properties, typically ranging from 1.4 to 20 kDa. These include bacteriocins, licheniformins, bacitracin, and surfactin (Shleeva et al., 2023).

2.1. Bacteriocins

Bacteriocins are ribosomally synthesized antimicrobial peptides or proteins that exhibit bactericidal or bacteriostatic activity against closely related bacteria. *Bacillus licheniformis* produces various bacteriocins (1.4–55 kDa), influenced by environmental conditions, growth phase, and strain genotype. For example, strain B116 secretes a ~4 kDa bacteriocin active against both Gram-positive and Gram-negative bacteria, including Staphylococcus aureus, Escherichia coli, and Salmonella spp. This compound is heat- and pH-resistant but is inactivated by pronase and partially affected by papain and lipase, suggesting a lipid component (Shleeva et al., 2023).

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2.2. Licheniformins

Licheniformins are lipopeptide antibiotics produced by *Bacillus licheniformis*, often occurring as closely related variants. The licheniformin from strain MS3 has a molecular mass of ~1.438 kDa, while the main forms—licheniformins A, B, and C—range from 3.8 to 4.8 kDa with similar amino acid compositions. Despite structural similarity, they differ in antibacterial potency and toxicity due to variations in side chains and lipid modifications (Shleeva et al., 2023).

2.3. Bacitracin

Bacitracin is a well-known polypeptide antibiotic non-ribosomally synthesized by certain strains of B. subtilis and B. licheniformis. It is composed of 12 amino acids, with four of them—glutamic acid, aspartic acid, phenylalanine, and ornithine—present in their D-isomer forms. The molecular mass of bacitracin is approximately 1.42 kDa. Bacitracin functions by interfering with bacterial cell wall synthesis, making it a clinically important peptide used to inhibit Gram-positive pathogens (Shleeva et.al.2023).

2.4. Surfactin

Bacillus licheniformis produces cyclic lipopeptides such as surfactin and its analog lichenysin, known for strong surface-active and antimicrobial properties. Strain HSN221 secretes nine variants of these compounds under optimal culture conditions (glucose, ammonium chloride, and yeast extract). The surfactin monomethyl ester homologues have molecular masses of ~1.048–1.063 kDa (ESI-MS) and exhibit potent antimicrobial and emulsifying activities with applications in pharmaceutical, agricultural, and environmental biotechnology (Shleeva et al., 2023).

3.Mechanism Of Action

Bacillus linchiniformis promote gut health through complementary competitive and immunological mechanisms. First, they competitively exclude pathogens by adhering to intestinal mucosa, thereby occupying ecological niches and preventing pathogen attachment and invasion. They also compete for nutrients by secreting extracellular enzymes that efficiently utilize available macro- and micronutrients, limiting resources required for pathogenic growth. In addition, Bacillus produces antimicrobial metabolites, including lipopeptides, bacteriocins, polyketides, and short-chain fatty acids (SCFAs), which directly inhibit pathogenic microorganisms. Furthermore, oxygen consumption by Bacillus reduces intestinal oxygen levels, creating a favorable hypoxic environment for beneficial anaerobic and fermentative bacteria such as lactic acid bacteria.

Simultaneously, antimicrobial peptides (AMPs) contribute to host defense through direct antimicrobial and immunomodulatory activities. AMPs regulate cytokine and chemokine production and modulate immune cells, including macrophages, dendritic cells, and lymphocytes, maintaining immune homeostasis. Mechanistically, AMPs disrupt microbial membranes via barrel-stave, carpet, or toroidal pore-forming models, leading to membrane destabilization and lysis. Additionally, they can penetrate cells and inhibit intracellular processes such as nucleic acid and protein synthesis, enzyme activity, and cell wall formation, thereby ensuring effective pathogen clearance and enhanced innate and adaptive immune responses.

Fig.1. Probiotic Bacillus employs multifactorial competition mechanism to restrict the expansion of pathogens through four pathways.

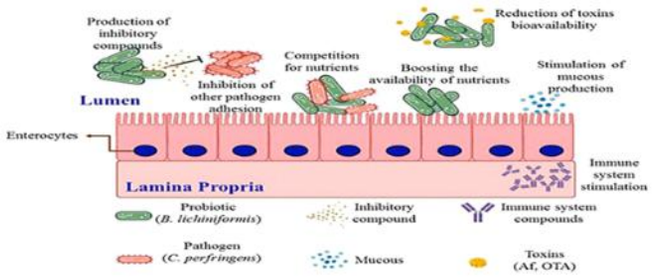


Fig.2. Models of antibacterial mechanisms of AMPs.

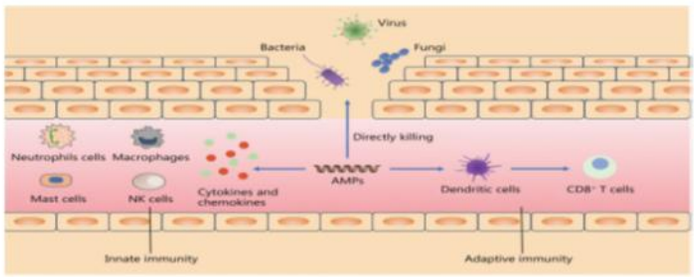
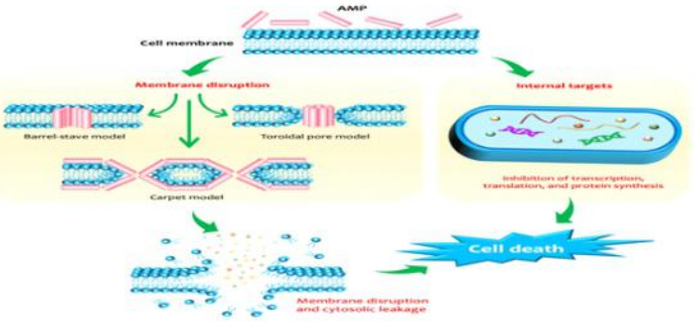


Fig.3. The membrane-disruptive and non-membrane-disruptive antibacterial mechanisms of antimicrobial peptides (AMPs).



4.MATERIALS AND METHODS

4.1. Experimental Design and Management

The trial was conducted at Harsh Broiler House -Bilaspur using Vencobb 430 straight run chicks (not sexed at hatchery) in three treatments of around 12000 birds in each treatment. A total of 36000 birds were considered for trial purpose. Feed Formulation used was same for all treatment groups except in T3 where PEPIGRO (Bacillus lincheniformis 3*109) was added at 300 gm per ton feed respectively in all stages. (Table.1).

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In the study, the energy level was equivalent to the standard requirements of broilers recommended in the Vencobb 430. The trial was carried out over a period of 42 days. The birds were fed ad lib feed and water was available all the time. Care was taken to provide good conditions by adopting strict biosecurity measures. The housing and vaccination procedures were same in both groups.

Table 1. Composition of basal diet for broiler chicks in control group for 3 phases.

Broiler Feed Formulation (Control)			
Raw Materials	Pre-starter	Starter	Finisher
Maize	625.15	652.75	686.65
HiPro Soya	335	300	260
Soya Crude Oil	6	14	23
Limestone Powder	8.5	8.5	8
Dicalcium Phosphate	10	10	8
L Lysine HCl	2.7	2.4	2.3
DL Methionine	3.3	3	2.7
L Threonine	1	1	1
Salt	2.5	2.5	2.5
Soda Bi Carb	1.5	1.5	1.5
Choline Chloride 60%	1	1	1
Organic TM	0.5	0.5	0.5
Broiler Vitamin Premix	0.5	0.5	0.5
Coccidiostat	0.5	0.5	0.5
AGP	0.05	0.05	0.05
NSP Enzyme	0.1	0.1	0.1
Phytase 5000	0.1	0.1	0.1
Feed Acidifier	1	1	1
Toxin Binder	0.6	0.6	0.6

*The figures are in Kilograms.

The premix provided the following per kilogram of the diet: vitamin A, 6000 IU; vitamin D3, 2500 IU; vitamin B1, 1.75 mg; vitamin B2, 5.5 mg; vitamin B6, 4 mg; vitamin B12, 0.18 mg; vitamin E, 25 mg; vitamin K3, 2.25 mg; Cu, 7.5 mg; Mn, 60 mg; Fe, 75 mg; Zn, 60 mg; Se, 0.15 mg; biotin, 0.14 mg; NaCl, 3.7 g; folic acid, 0.8 mg; pantothenic acid, 12 mg; phytase, 400 U; nicotinic acid, 34 mg; chloride, 350 mg. *Nutrient levels were all calculated values.

4.2. Treatment Details

T1: Control group fed basal diet

T3: Control group fed basal diet + PEPIGRO @300 g PMT

4.3. Parameters Studied-

1. Body Weight gain was recorded weekly

2. Feed Consumption recorded daily and leftover feed was adjusted in the other day quota to know actual intake.

3. Mortality was recorded daily

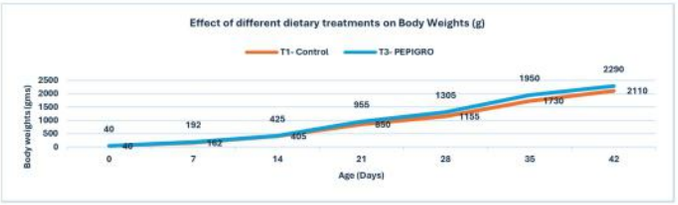
4. EEF calculated post harvesting of the flock

5. FCR was calculated every week and post harvesting of the flock.

5. Result:

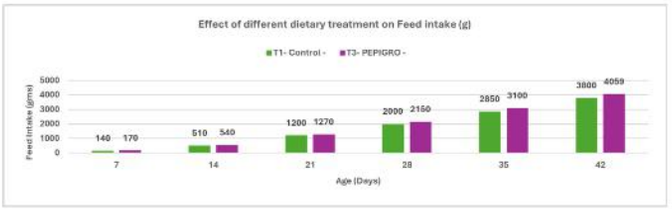
Effect of Pepigro on growth performance parameter in broiler.

Fig.4. Effect of different dietary treatments on Body Weights (g)



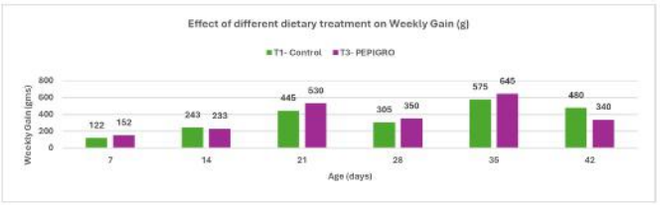
Conclusion: PEPIGRO supplementation at 300g/ton of feed (T3) resulted in a statistically significant 8.18% increase in broiler body weight compared to the control (T1), indicating improved growth performance.

Fig.5. Effect of different dietary treatment on Feed intake (g)



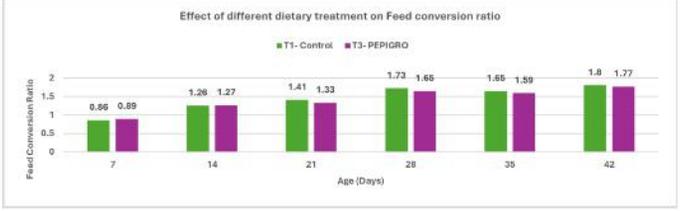
Conclusion: The broiler supplemented with PEPIGRO (T3) at 300g/ ton of feed had a feed intake of 4059 g, which is 6.59% higher than the control group (T1) with 3800 g feed intake. This increase in feed intake indicates that PEPIGRO supplementation positively influenced the birds' feeding behaviour, likely by enhancing the palatability or nutrient availability of the diet.

Fig.6. Effect of different dietary treatment on Weekly Gain (g)



Conclusion: PEPIGRO (T3) supplementation in broiler diet at 300g/ton of feed resulted in the average percentage difference in weekly gain between T1 (Control) is approximately 6.22%. This indicates that PEPIGRO supplementation had a positive overall effect on growth performance, enhancing weight gain efficiency in broiler chickens.

Fig.7. Effect of different dietary treatment on Feed conversion ratio



Conclusion: PEPIGRO (T3) supplementation in broiler diet at 300g/ton of feed resulted in a 1.68% improvement in feed conversion ratio (FCR) compared to the control group (T1), indicating enhanced feed efficiency and better growth performance.

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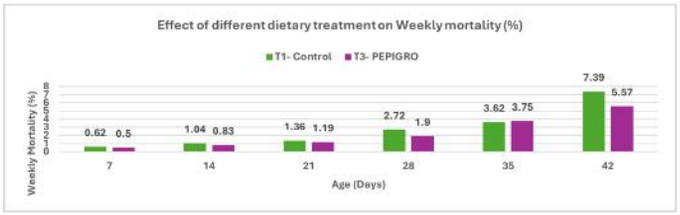
Fig.8. Effect of different dietary treatment on Weekly mortality (%)



Conclusion: PEPIGRO supplementation at 300g/ton of feed reduced mortality in broiler poultry from 7.39% in the control group to 5.57%, reflecting a 28.08% decrease. This suggests that PEPIGRO may contribute to improved bird health and survivability during the rearing period.

Table 2. Summary of the Report

Parameters	T1- Control	T3- PEPIGRO	% Difference
Body Weight (g)	2110	2290	8.18
Feed Intake (g)	3800	4059	6.59
FCR	1.8	1.77	1.68
CFCR	1.77	1.69	4.62
Mortality (%)	7.39	5.57	28.08

6. Discussion

The discussion for this article highlights the significant positive effects of PEPIGRO, a *Bacillus licheniformis*-based probiotic, on the growth performance, feed efficiency, and health status of commercial broilers under field conditions. The 8.18% increase in body weight and 6.59% increase in feed intake, along with improvements in feed conversion ratio (FCR), align well with previous studies showing Bacillus probiotics enhance nutrient digestibility, modulate gut microbial populations, and improve intestinal morphology (Pan et al., 2022; Hung et al., 2019). These effects are especially valuable in the context of rising restrictions on antibiotic growth promoters (Tang et al., 2017), pushing for safer and sustainable alternatives.

The notable 28.08% reduction in mortality observed in this study suggests enhanced resilience of broilers to environmental stressors, likely owing to improved gut barrier integrity and immune modulation. *Bacillus licheniformis* produces antimicrobial peptides, enzymes, and metabolites such as bacteriocins and surfactins that inhibit pathogens like Clostridium perfringens, a major agent of necrotic enteritis (NE) in poultry (Shleeva et al., 2023; Wade and Keyburn, 2015). PEPIGRO's capacity to maintain intestinal health and microbial balance may underlie the reduced pathogenic infections and inflammation, consistent with findings that show Bacillus supplementation upregulates tight junction proteins and mucins while enhancing beneficial microbes like Lactobacillus (Chen and Yu, 2020; Wang et al., 2017).

Moreover, the probiotic's ability to stimulate the host immune system by inducing cytokine production and activating phagocytic cells further supports its protective role in the gut environment (Babakuliyev et al., 2022). This immunomodulatory effect is critical for mitigating subclinical infections and improving overall flock welfare, which translates into better productivity under commercial rearing conditions.

Additionally, PEPIGRO contributes to antioxidant status improvement by elevating enzyme activities such as superoxide dismutase and glutathione peroxidase, reducing oxidative stress that commonly compromises poultry health under heat stress conditions (Jia et al., 2018). This antioxidant benefit complements its antimicrobial and immunomodulatory functions.

In conclusion, this study reinforces the role of *Bacillus licheniformis* as a multifunctional probiotic that enhances growth performance, feed efficiency, and health in broilers. It offers a sustainable alternative to antibiotics, aligning with global efforts to reduce antibiotic use in animal production. Future studies should explore optimal dosing strategies, combinations with other feed additives, and long-term effects on microbiota composition and immune function to fully harness the benefits of PEPIGRO in commercial poultry systems.

7. Conclusion

The trial was conducted in the extreme heat season where average temperature in the surrounding was around 42-45 degree Celsius. The T3 (PEPIGRO) group showed notable improvements compared to the T1 (Control) group. Body weight in T3 (PEPIGRO) increased by 8.18% compared to T1 (Control), indicating better growth performance. Both Feed Conversion Ratio (FCR) and Corrected Feed Conversion Ratio (CFCR) in T3 (PEPIGRO) improved, showing reductions of 1.68% and 4.62%, respectively, compared to T1 (Control), indicating more efficient feed utilization. Additionally, mortality rate in T3 (PEPIGRO) decreased significantly by 28.08% compared to T1 (Control), reflecting better overall health and survival. These results suggest that PEPIGRO supplementation positively impacts growth, feed efficiency, and mortality compared to Control.

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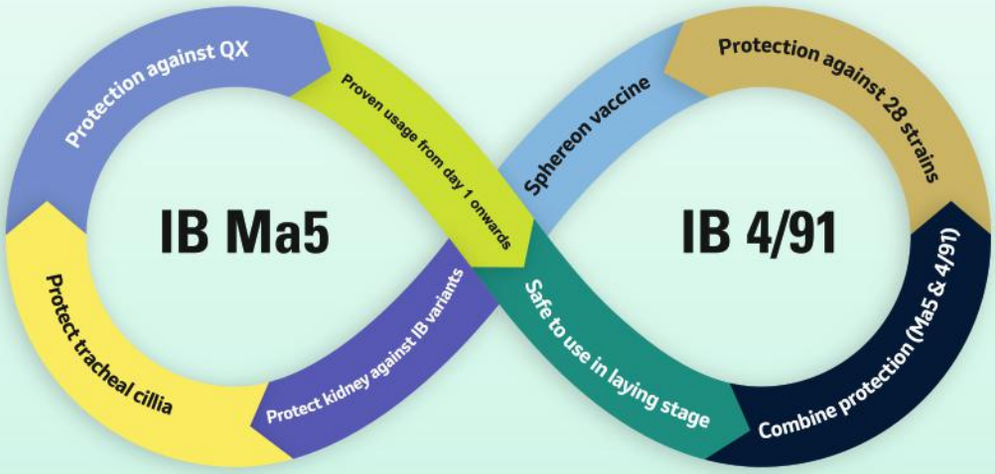

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