

# PROPULSE



**BLU NOVA™**

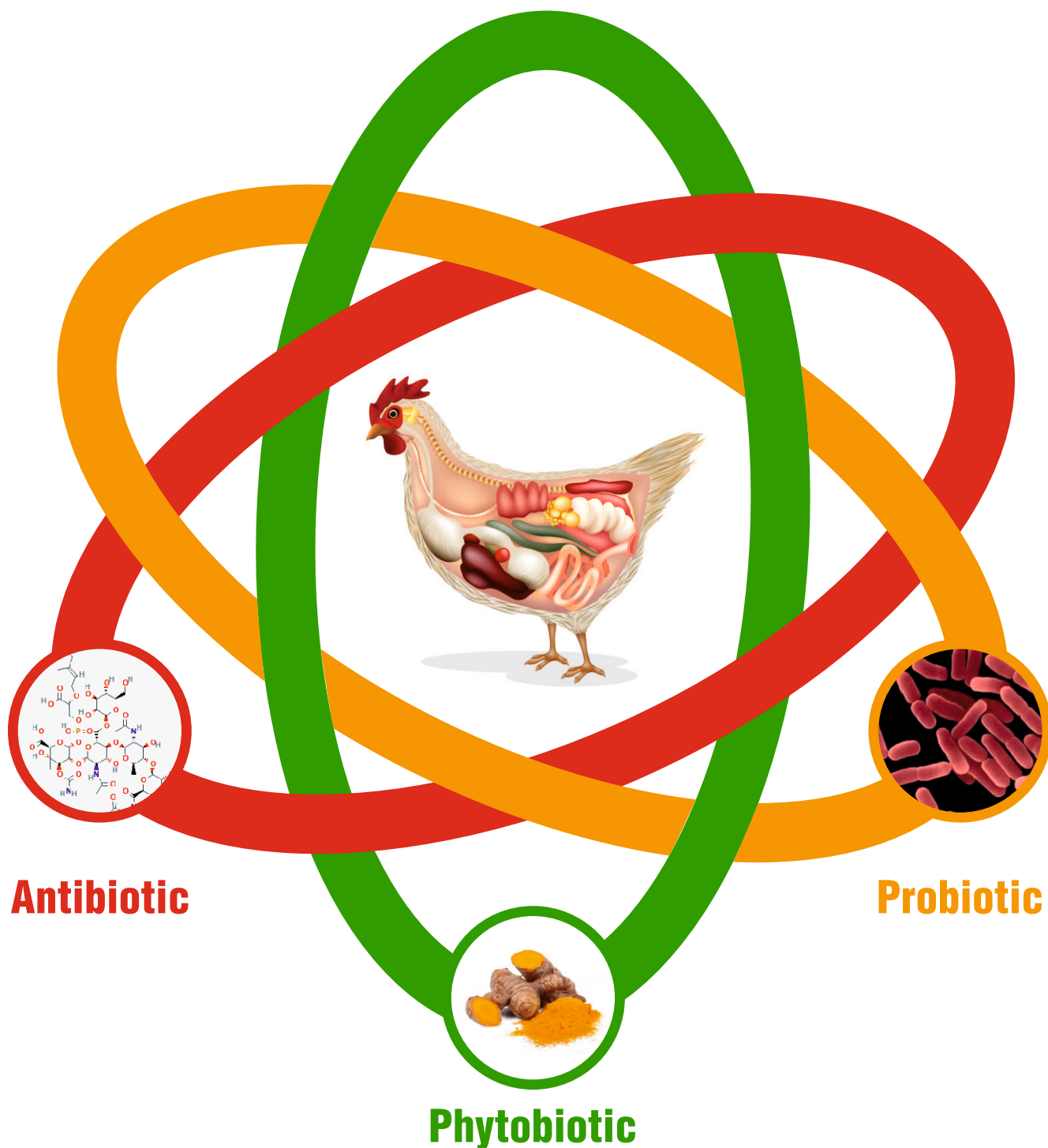
**BOVI NOVA™**

**AVI NOVA™**



# BAMBERCIN<sup>®</sup> PLUS

The Novel & Potent **TRIBIOTIC**



# COMPARATIVE EFFICACY OF VARIOUS GROWTH PROMOTERS ON PERFORMANCE OF BROILER CHICKEN

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Modern chicken face tremendous performance pressure which sometimes leads to mortality due to metabolic, locomotor, gut related disorders due to faster growth rate & higher breast meat yield consequent to improvements in genetics, nutrition, management, disease prevention, etc. Substantial reduction in mean age of liquidation makes the challenge of maintaining gut health paramount among all.

The digestive, absorptive and secretory ability of the gut is solely dependent on its integrity and microbiome. Several stressors like coccidiosis, litter management, clostridium, other pathogenic bacteria & viruses, mycotoxin, nutritional and managerial errors affect gut functionality.

## Necrotic Enteritis (NE)

Clinical NE is associated with severe losses due to heavy mortality and concerns the farmer more, whereas the subclinical form is responsible for substantial losses on FCR and is being ignored generally which was very much evident during intestinal lesion scoring in broilers performed by our team, pan India.

Losses due to NE are estimated to cost the poultry industry \$2 billion annually worldwide. Causative organism of NE is *Clostridium perfringens* Type A & C which is a gram positive, spore forming, anaerobic bacteria.

This bacterium produces different toxins like  $\alpha$ ,  $\beta$  &  $\xi$  but the most important culprit is NetB toxin, an exotoxin, which may lead to systemic circulation of this bacterium to end up with cholangiohepatitis.

NetB toxin damages intestinal cells and causes leakage of plasma from enterocytes; further they produce perfrin, inhibit the proliferation of harmless Clostridia and increase the proliferation of pathogenic bacteria leading to dysbacteriosis resulting in heavy mortality, mostly during 2 - 5 weeks of age.

The clinical infection is characterized by sudden onset, high mortality, and necrosis of the mucous membrane of the small intestine and mortality may reach up to ~ 1% per day.



Fig: 1 Turkish Towel appearance in Necrotic Enteritis

Birds with NE are depressed, reluctant to move and have ruffled feathers. They are usually diarrhoeic, may be anorexic and dehydrated. The course is often per-acute, with death in 1-2 hours. Mortality rates may be as high as 50%, but virulence varies with the infecting strains.

Some strains cause cholangiohepatitis in broilers, as *Clostridium spp.*, a strictly gut pathogen, gets into the circulation due to breach in the gut barrier function.

Modern broilers are genetically selected for continuous eating and they continue eating during clinical & subclinical NE challenges, thus leading to a shift in the microbiota and subsequently dysbacteriosis. Deep seated intestinal damage destroys the lamina propria leading to destruction of immune cells in the Peyer's patches and makes the bird incompetent immunologically.

## Solution

Different solutions exist for the control of clinical as well as subclinical NE like antibiotics, synbiotics, probiotics, essential oils, bacteriophages, antimicrobial peptides, etc.

Solutions like synbiotics, antimicrobial peptides, probiotics, essential oils show excellent promise as they provide efficient control of clinical & subclinical NE with additional benefits like replenishment of microflora and better immunocompetence.

In this study we have compared the efficacy of 3 different growth promoters on the performance parameters in commercial broilers.

## BAMBERCIN PLUS - Novel & Potent Tribiotic

A unique and novel combination of Bambermycin / Flavophospholipol (exclusively for veterinary use) and adequate CFUs of *Bacillus subtilis* and *B. licheniformis*, fortified with Curcumin in a compatible base for improving performance and productivity in poultry.

### Bambermycin / Flavophospholipol

Class: Phosphoglycolipids

Spectrum: Primarily acts against gram positive pathogens like Clostridium and Staphylococci, but spares beneficial microflora, like Lactobacillus & Bifidobacterium and hence improves microflora balance.

### Probiotics

*B. subtilis* & *B. licheniformis* are generally regarded as safe (GRAS) and inhibit pathogenic bacteria, regulate gut microbiota, help in immuno-modulation are highly stable during feed processing.

### Curcumin

Curcumin is well known for its safe & natural phyto-biotic action. It has a wide range of biological properties such as anti-oxidant, anti-bacterial, anti-viral, anti-fungal and

anti-inflammatory activities. It helps in the stimulation of bile secretion and bile flow, thereby maintaining liver health.

## NAGRONEX ESF - Phyto-biotic Growth Promoter

It is a synergistic combination of essential oils (oregano, clove, cinnamon & eucalyptus) with short chain fatty acids (SCFA). It has anti-bacterial, anti-viral, anti-fungal, anti-coccidial and anti-oxidant properties that promote performance and productivity.

### Growth Promotion Effect

NAGRONEX ESF improves intestinal histomorphometry parameters like villus height / crypt depth ratio, which leads to a wider surface area for better absorption of nutrients, electrolytes and thus combats villus atrophy & promotes intestinal integrity.

### Antimicrobial Effect

It has both direct and indirect anti-microbial effects due to the synergistic interactions of its various active components. Phenols directly act by altering the cell wall of some bacteria and fungi resulting in water imbalance and cell death. It indirectly helps by ensuring quicker renewal of enterocytes, which creates a hostile environment to bacterial and coccidial development.

### Objective of the Study

To evaluate the effects of dietary supplementation of different gut acting growth promoters (Nagronex ESF and Bambercin Plus) on performance of male broiler chickens against Bacitracin Methylene Disalicylate.

### Materials and Methods

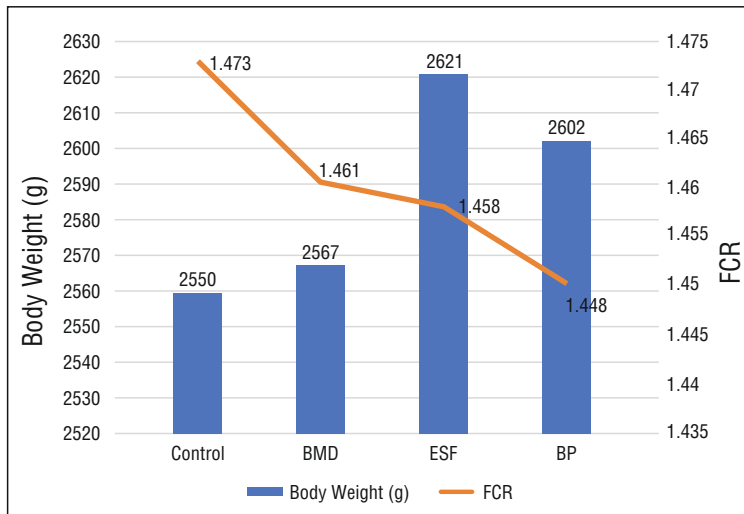
#### Dietary treatments and experimental diets

Group	Trial
Control	No Antibiotic / Probiotic
BMD	Control + 500 g Avibac MD (BMD 10%)
ESF	Control + 100 g Nagronex ESF
BP	Control + 250 g Bambercin Plus

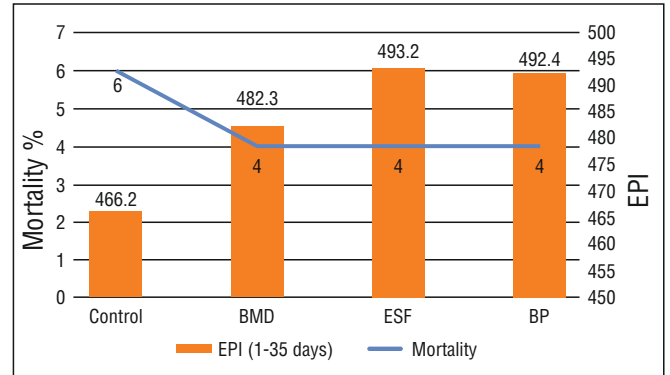
## General Bird Husbandry

Flock : 410 one-day old male broiler chicks  
 Period : 1 to 35 days  
 Diet Form  
     Days 1 to 21 : Crumbles  
     Day 22 onwards : Pellets  
 Diet Type  
     Starter : Days 1-14  
     Grower : Days 15-28  
     Finisher : Days 29 to 35  
 Drinking Water : Ad libitum  
 Litter Material : Wood shavings and paddy straw  
 Vaccination : As per recommended schedule.  
 Placement : 10 replicates & 10 chicks in a pen measuring (1.2 m x 1.2 m)

other dietary treatments. However, this ought to be an artefact since such difference was not followed during the subsequent periods of measurements during which FCR was found to be similar across the groups. The birds supplemented with Bambercin Plus had marginally (by 2.5 points) better FCR as compared with the Control group.



Graph 1: Body Weight & FCR



Graph 2: EPI & Mortality %

**EPI:** Numerically EPI was marginally better in the Nagronex ESF and Bambercin Plus supplemented groups as compared with the Control group.

## Discussion and Conclusion

It was concluded from the present investigation that supplementation of **Nagronex ESF** and **Bambercin Plus** numerically improved body weight, FCR and performance of the birds.

The reason behind better performance of **Bambercin Plus** against BMD may be better control of *Clostridium*, sparing effect on the microbiome and additional replenishment of microflora in the gut.

**Nagronex ESF** performance is an outcome of different modes of action of the phytochemicals like anti-microbial, anti-inflammatory, endogenous enzyme secretion, immunomodulatory, anti-oxidant, proliferation of microbiome and maintaining gut pH at optimum level.

The data had a trend which suggested that with these supplements, it may be possible to get better FCR and productivity index as compared with the conventional antibiotic growth promoters like BMD.

*References are available on request.*

## Results

**BW:** At the time of harvest at 35 d of age, birds supplemented with Nagronex ESF had almost 55 g more BW as compared with that in the BMD supplemented group. Similarly, the birds supplemented with Bambercin Plus had 35 g more BW than that of the BMD supplemented group.

**ADG:** During 29 - 35 d of age, ADG in the Nagronex ESF & Bambercin Plus supplemented groups was comparatively higher than that in the NC & BMD supplemented groups, resulting in marginally better ADG in the Nagronex ESF & Bambercin Plus supplemented groups as compared to the NC & BMD supplemented groups during 1-35 d.

**FCR:** FCR during 1-14 d was found to be higher in the BMD supplemented group (P = 0.032) as compared with the

# MILK FEVER IN DAIRY CATTLE

Milk fever is a metabolic disease of dairy cattle occurring within 72 hours of parturition. It is characterised by hypocalcaemia, neuromuscular changes, paresis, recumbency, circulatory collapse and diminution of consciousness. The word 'fever' is a misnomer, as body temperature during the disease is usually below normal. Tremor is found in the eye and muscles. The disease is termed as metabolic disorder rather than deficiency disease, the deficiency of calcium in feed is not the main cause of disease. Milk fever occurs immediately after or close to calving because of low level of calcium in the blood. Milk fever is occurred when the demand of calcium for milk production is more than the body's ability to mobilize calcium from body reserves. Low blood calcium level interferes with muscle function throughout the body, causing weakness, depression, and death. After parturition there is excessive loss of calcium in the colostrum which is beyond the capacity of absorption from the intestines and not mobilize calcium from the bones, most lactating dairy cows enter a stage of negative Calcium balance in the body. Milk fever is most common in cows at their third to seventh parturition. Jersey breeds of cattle develop milk fever more frequently than Holstein–Friesian cows.

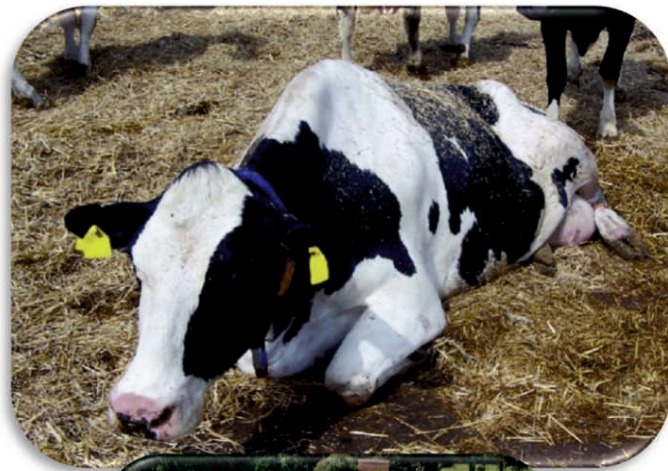
## STAGES AND SYMPTOMS OF MILK FEVER

### Stage 1:

In this stage the cow is still in standing position. Animals show signs of nervousness, excitement, hypersensitivity, and muscle tremor, animal restraint to moving, decreased feed intake, shaking of head, protrusion of tongue and grinding of teeth. The rectal temperature is normal to slightly above normal; the skin may feel cool to the touch. The cow may shift her weight repeatedly from one side to another and falls easily.

### Stage 2:

Owners first detect a problem with their cows in this stage. Cow is in sternal recumbency with depressed consciousness, usually with a lateral kink in the neck or the head turned into the flank. The cow is unable to stand. The muzzle is dry, the skin and extremities cool, and the rectal temperature subnormal (36 to 38° C, 97 to 101° F), heart rate is increased (about 80 bpm), ruminal stasis and secondary bloat are common. There is also relaxation of the anus and loss of the anal reflex. Prolapse of the uterus is a common complication of milk fever.



### Stage 3:

Stage 3 means that milk fever has progressed to the point where if treatment is not given quickly, the cow may die. The cow is in lateral recumbency. There is complete flaccidity on passive movement, and the cow cannot assume sternal recumbency on its own. Subnormal body temperature. The heart sounds are almost inaudible, and the rate is increased up to 120 bpm; the pulse is almost impalpable, and it may be impossible to raise the jugular veins. Bloat is common because of prolonged rumen stasis and lateral recumbency.



Every effort must be made to treat affected cows as soon as possible after diagnosis. A typical treatment for milk fever for an adult lactating dairy cow with parental injection of 200-350ml Calcium-borogluconate by slow IV injection, followed by subcutaneous injection with rest of dose. Other than Calcium-borogluconate, compound containing Calcium-Magnesium-Borogluconate can be given. These compounds are more effective when milk fever is associated with hypo-magnesaemia and hypo-phosphataemia. This treatment is usually very effective if milk fever is diagnosed in the early stages. Most cows can recover from milk fever, especially if it is treated in the early stages.

In extreme climatic conditions, erection of a shelter over the cow is advisable if she cannot be moved to permanent shelter. If a cow is recumbent for more than 48 hours, occasional assisted lifting using appropriate cow lifters should be considered.

### SOME UNKNOWN FACTS

- Cattle have almost 360° panoramic vision. This helps them to see predators coming from any direction.
- The natural life expectancy of a cow is around twenty years. Some get up to 25 years old. The age of a cow can be determined by looking at its teeth.
- Cows have a strong sense of smell. They can detect odours up to six miles away.
- Cows can also hear both low and high frequency sounds beyond human capability.
- Cows are moving constantly during grazing and can cover 13 km per day.
- Besides the 'mooing' cows use their body language, such as the position of the head, limbs and tail, as well as facial expressions, in order to communicate.
- Cows show their excitement when let out into a field after long periods confined indoors.
- Cows are devotional mothers and are known to walk for miles to find their calves.
- Cows have no upper front teeth. Therefore, when they're eating food, they press their sharp bottom teeth against the top hard palate of their mouth to cut blades of grass.
- Cows are very social and don't like to be alone. For example, when a cow isolates herself it's usually because she is sick or about to give birth.
- A cow has 32 teeth and will chew about 40-50 times a minute.
- Cows spend about 10 hours a day lying down.
- Cows will stand up and lay down about fourteen times a day.
- Cows can sleep while they're standing.
- Cows stomach can hold upto 50 gallons of partially digested food and they can chew for 8 hours a day by consuming 40 pounds of food a day.
- A cow can urinate upto 30 gallons every day.
- Cows are awesome swimmers! They may seem heavy, but they are born swimmers.
- They are not sleepy heads like they seem. Cows can spend 10 to 12 hours just lazing away, sitting around but interestingly they do not sleep for more than 4 hours a day.
- They cannot see red. Cows are colour blinded as per human standards, they do not even have the receptors in the retina which can recognise the red colour. When a bull is chasing the red, it is chasing a dull yellowish grey piece of waving flag. They don't care about the colour.
- Cows can walk upstairs, but it wouldn't be able to walk back down again afterward. It is because the joints in their knees don't bend the right way, so wouldn't let them.

### GENERAL MANAGEMENT AND CLINICAL CARE PROCEDURES DURING MILK FEVER:

The care of the cow and the calf following milk fever is important. If the cow is recumbent for any length of time, she must be kept propped up in sternal recumbency and not left in lateral recumbency, which may result in tympany, regurgitation, and aspiration pneumonia. The cow should be rolled from side to side every few hours and provided with adequate bedding or moved to a suitable non-slip ground surface.



### PREVENTION OF MILK FEVER CONVENTIONAL METHODS FOR THE PREVENTION OF MILK FEVER INCLUDE:

#### Method 1:

Restriction of calcium rich diet before calving - This activates the calcium homeostatic mechanisms in the body of animals. Calcium is an essential mineral required to performing essential body function. For prevention of milk fever, calcium and calcium rich diet should never be supplemented to cow before calving. Dietary calcium level should also be low (intake should be around 20 g/day). Vitamin D helps in absorption of calcium from the digestive tract and significantly helps to prevent milk fever when given a week or so before calving.

#### Method 2:

Magnesium supplementation- Supplementation of magnesium at the rate of 15 to 20 g/day along with easily digestible carbohydrate helps in preventing milk fever.

#### Method 3:

Supplementation of oral calcium to susceptible animal before and after calving- This method is not advisable for first line of prevention. If an animal very prone to milk fever this method can be used.

## DIETARY CATION-ANION BALANCE:

Manipulating cation-anion balance in prepartum diet has got significant influence on milk fever development. Diet containing higher level of anions (chloride and sulphur) than cations (sodium and potassium) may prevent occurrence of milk fever. Metabolic acidosis is occurred due to negative DACB, which results in more production of Vitamin D3. With the activation of parathyroid gland, mobilisation of calcium from bones and absorption from intestine occurred. Due to the induced metabolic acidosis, and a conservation of bicarbonate ions, the urine becomes more acidic, which make easy for monitoring urine pH for DACB

## ORAL CALCIUM GEL SUPPLEMENTATION

**(KALSEZ PROGEL):** For prevention of milk fever, oral calcium gel can be used to the milk fever prone animals. The recommended initial dose is one tube of **Kalsez Progel** for freshening dairy cattle given before or after calving. If milk fever develops, administer one tube of **Kalsez Progel** following regular intravenous milk fever treatment to provide supplemental oral calcium. Administer another tube of **Kalsez Progel** 8 to 16 hours later. If condition continues, veterinarian's consultation required. Total dose will vary according to the animal's condition. Do not exceed 2 doses within 24 hours except on the advice of a veterinarian.



## DON'T BE FOOLED BY MILK FEVER'S NAME !



Milk fever also known as hypocalcemia, does not cause fever at all.

- Milk is high in calcium. For a human, 30% of the daily requirement for calcium is contained in just one cup of milk.
- At calving, a cow mobilizes calcium from its bones to pour into colostrum, which can result in clinical or subclinical hypocalcemia.
- At calving, cows pump this calcium into their milk to support skeletal growth of the calf.
- Colostrum has twice as much calcium as regular milk.
- Subclinical hypocalcemic cows show minimal, nonprogressive clinical signs.
- Many older cows develop some level of subclinical hypocalcemia (SCH), but it is most harmful if it persists past 48 hours post-calving.
- Cows that experience clinical hypocalcemia are at a greater risk for other health issues, including displaced abomasums.
- Cows with clinical hypocalcemia can lose up to 14% of milk production throughout an entire lactation.
- A cow continues to pump out calcium as it reaches peak milk. Cows struggle with calcium balance after calving just like they struggle with energy balance.
- A cow provides some calcium during pregnancy to develop the fetal skeleton, but in the 12 hours before birth, a tremendous amount of calcium must go into colostrum. A cow then repeats that process 12 hours later. In the first 24 hours, the calcium outflow can be 20 to 30 grams.
- Cows lose 9% to 13% of their skeletal calcium within the first 30 days in milk. In all, about 1.33 kgs of calcium are lost from the 9.53 kgs available in their bones.
- The skeletal store of calcium is sufficient, but it takes several days to activate the mechanisms. That is why cows find themselves in calcium deficiency.

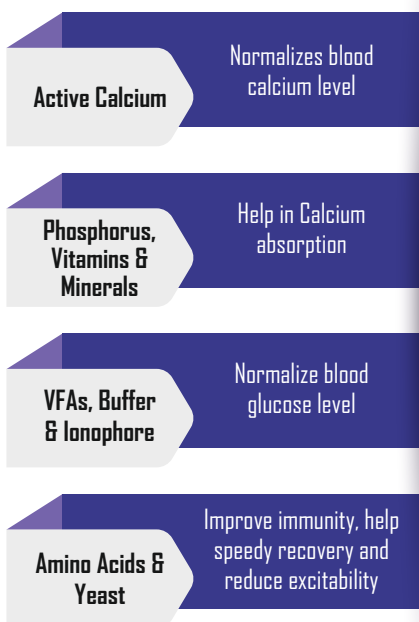


# KALSEZ™

## PROGEL

An Innovative & Optimized Blend of Active Calcium, Phosphorus, Vitamins, Amino acids, Buffer, VFAs, Ionophore & Yeast, which helps to maintain normal calcium levels in ruminants during both pre-calving and post calving periods

Supportive therapy to IV calcium infusion



### BENEFITS:

- Ensures rapid & efficient absorption of calcium, enhances serum calcium level within 15 min. of oral administration and maintains serum calcium level longer than I/V calcium therapy
- Provides 5 times more calcium than I/V calcium injection
- Prevents milk fever & associated complications
- Increases milk yield, favours normal contraction of the uterus, normal calving and timely expulsion of the placenta
- Highly useful in prolapse cases

### Recommended Usage:

- Administer 300 ml squeezable bottle per day for 10 days continuously before calving & another 300 ml squeezable bottle per day for 10 days continuously after calving.
- If milk fever develops after calving, administer another bottle of 300 ml squeezable bottle within 24 hours of the 1<sup>st</sup> dose, along with regular treatment for milk fever to provide supplemental oral calcium.
- Do not exceed 2 doses within 24 hours except on the advice of a veterinarian.
- The total requirement may vary according to the condition of the animal.

### Usage Directions:

- Unscrew the cap of the bottle to open & remove the induction seal completely.
- Secure the animal's head in an elevated position.
- Place the unsealed nozzle of the bottle on one side of the mouth.
- Administer the entire contents into the mouth by slowly squeezing from the bottom side of the bottle.

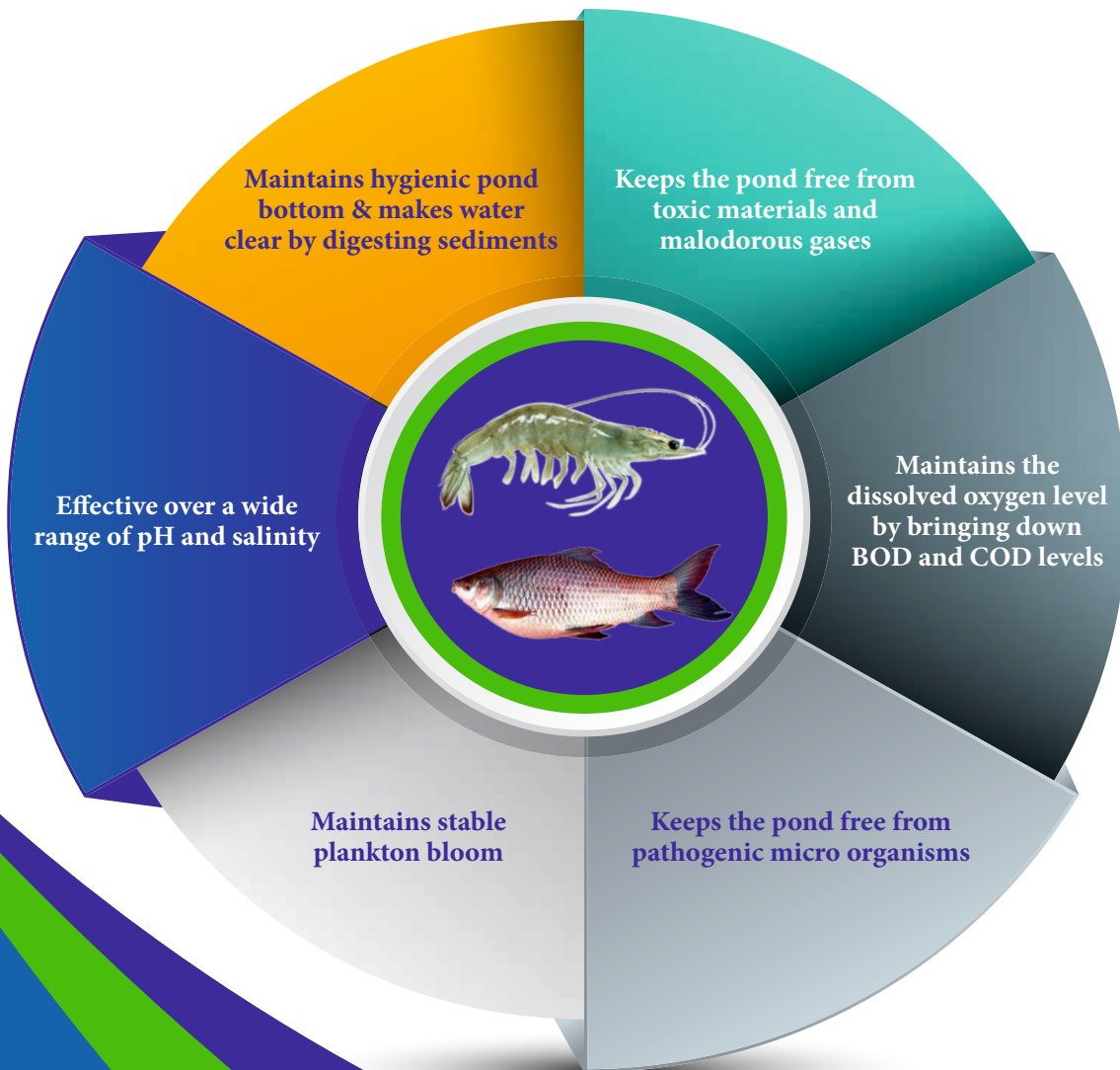
Pack:  
300 ml squeezable bottle

**Fast, Reliable & Extended Action**  
**Minimizes incidence of Milk Fever & Ketosis**  
**Maintains Peak Milk production for a longer period**



# BACITOX® PLUS

Unique & Innovative Soil &  
Water Conditioner



**Probiotic Solution with  
Unique Diversity**

# PROBIOTICS FOR SUSTAINABLE AQUACULTURE

Aquaculture is one of the most important industries in terms of ensuring food security. Farmers are changing their management practises from low stocking density to high stocking density, as well as their use of excess feed and antibiotics, in order to increase aquaculture production. A variety of chemicals and antibiotics have been used in the culture system to prevent diseases and economic loss. Excessive use of these chemicals causes contamination of aquatic animals as well as the development of antibiotic-resistant pathogenic organisms. This leads to aggregation of toxic substances in cultured animals and poses a risk to consumers. As a result, developing environmentally acceptable alternatives has become critical in order to generate healthier aquatic fauna.

Majority of the researchers concluded that Probiotics as an environmentally friendly solution to the aforementioned aquaculture concerns. Probiotics are thought to be safe additives that can help the host's physiological state, manage diseases, and enhance water quality.

## Definition and History of Probiotics

The word "probiotics" comes from the Greek it means "for life." According to the World Health Organization (WHO), the most widely accepted definition of probiotics is "live microorganisms that when administrated in adequate amounts confer a health benefit to the host"

Probiotics are not a new concept. Elie Metchnikoff, a Russian bacteriologist and Nobel winner, documented a clear relationship between human lifespan and the importance of maintaining a good balance between beneficial and pathogenic bacteria in the human intestine in 1909. Probiotics have been used as fermented dairy products to treat some diseases since the discovery of longer-term milk preservation around 2000 BC.

They include live microorganisms that can battle some infections and have a high nutritional value.

## How do Probiotics work



## Mode of action of Probiotics:

### Antagonism by competition for nutrients

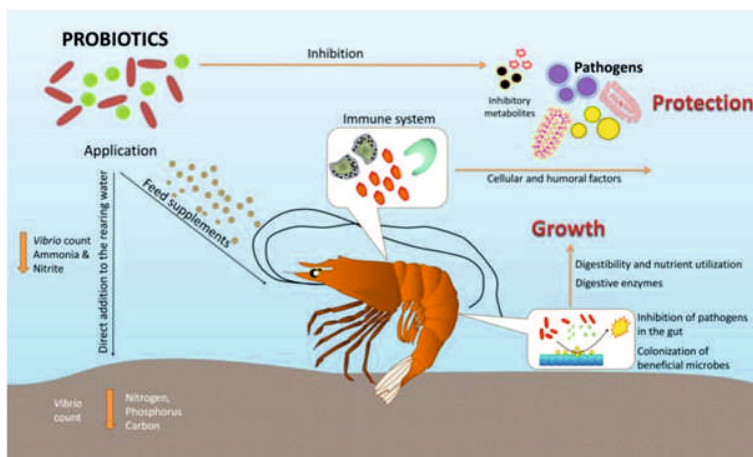
Probiotics use competitive exclusion to prevent harmful microorganisms from colonising the gastrointestinal system by competing for essential nutrients. This mechanism is called barrier effect. Applied probiotic strains use the available resources in the gastrointestinal system to avoid colonisation of pathogenic bacteria by making nutrients inaccessible to other harmful bacteria

## Competition for adhesion

As previously stated, probiotics compete with pathogens and actively prevent their colonisation in the animals' guts or other tissue surfaces. Harmful bacteria adherence to tissue surface or walls of gut and intestine is crucial during the early stages of infection, and the probiotic function includes competition for adhesion receptors with pathogens. The pathogenic organisms are removed from the host by a combination of competitive exclusion by nutrients and adhesion site.

## Production of antimicrobial compounds

Antimicrobial compounds, such as antibacterial, antifungal, and antiviral substances, are produced by probiotic bacteria strains. In general, antibacterial action of probiotics is due to the synthesis of antibiotics, bacteriocins, siderophores, lysozymes, proteases, hydrogen peroxide, and other components, which can function individually or in combination. Some probiotic strains capable of producing hydrogen peroxide and oxidising the cell wall of pathogenic bacteria. Siderophores are small, high affinity iron chelating compounds. Siderophores play an essential role in controlling fish infections by reducing Fe, which is necessary for bacterial and virulence interactions. The major organic acids generated by probiotics are acetic acid and lactic acid, while lactic acid acts by disrupting the outer membrane of gram-negative bacteria and inhibiting pathogens. Bacteriocins are peptides released by probiotic bacteria to prevent the development of harmful bacterial strains. Certain probiotic bacterial strains have antiviral properties. They boost the host's immunity and disease resistance, as well as resist and prevent viral infection.



## Stimulation and enhancement of host immunity

Probiotics play an important role in maintaining the delicate balance between innate and adaptive immunological responses. Probiotics influence host innate and adaptive

immune responses by altering the activities of dendritic cells, macrophages, and T and B lymphocytes. Toll-like receptor activation is one of the methods through which probiotics regulate immunomodulatory activities. As a consequence of both serological immunity improvement and competitive exclusion in fish and shrimp guts, effective probiotic treatments may give a broader range and higher non-specific disease protection.

## Bioremediation

This is an essential component of probiotics usage in aquaculture, especially in hatcheries, semi-intensive and intensive fish and shrimp production. Maintaining acceptable water quality parameters is critical in intensive or semi-intensive culture systems for disease-free output. Excessive stocking and over feeding degrade water quality and increase vulnerability to infectious and non-infectious diseases. Application of probiotic strains enhance water quality and contribute for the growth of cultured aquatic fauna. It works as a bioremediation and eco-friendly bio-control agent in aquaculture, improving the health and performance of cultured species. They regulate ammonia, nitrite, hydrogen sulphide, and other gases and also speeding the breakdown of organic materials.

## Growth Enhancer

Aqua farmers are interested in using of probiotics as a method of promoting growth performance. Research results show that using probiotics in aquaculture enhances the development and health of cultured organisms and increases survival rate. Probiotic bacteria can improve appetite as well as digestibility of the cultures species.

## Composition:

**BACITOX PLUS** provides stable and adequate quantities of *Bacillus subtilis*, *Bacillus licheniformis*, *Bacillus megaterium*, *Bacillus polymyxa*, *Nitrosomonas*, *Nitrobacter*, *Rhodococcus* and *Thiobacillus denitrificans*

## Functions:

*Bacillus subtilis* aids in feed digestion by generating a variety of enzymes such as amylases, proteases, and lipases, and other. It also aids in the breakdown of unwanted and waste organic matter and inhibits the growth of undesirable microbes in the pond. It also helps in denitrification and the converting of nitrates into oxygen and nitrogen.

*Bacillus megaterium* decomposes waste and excess organic matter in the pond, therefore helping to maintain the water clean. It is also known for producing substances that inhibit the growth of undesirable bacteria, particularly *Vibrio* spp., and for its ability to solubilize phosphates

*Bacillus licheniformis* suppress the growth of undesirable microbes by producing antibiotic like Bacitracin. It also helps in degrading excess organic chitinous exoskeletons of the shrimps, because of its ability to produce the enzyme Keratinase

*Bacillus polymyxa* produces large quantities of Amylases and other enzymes to digest many types of carbohydrates, proteins & fats in aquatic environment besides being helpful in degrading diverse organic waste materials and solubilizing phosphates. It is known to produce antibiotics like polymyxin, which suppresses the growth of pathogens

*Nitrosomonas* and *Nitrobacter* plays important role in Nitrification converting ammonia to nitrates. Nitrification is a two-step process by which bacteria of the genus *Nitrosomonas* oxidize ammonia or ammonium to nitrite, and bacteria of the genus *Nitrobacter* oxidize nitrite to nitrate

*Rhodococcus* is a genus of aerobic, nonsporulating, nonmotile Gram-positive bacteria. It effectively degrades sludge and improves the pond health by generating oxygen. It further helps in improving species coloring due to nature pigments production

*Thiobacillus denitrificans* is short rod-shaped Gram-negative, obligately chemolithoautotrophic. It has ability to oxidize reduced sulphur compounds in nitrate-dependent, anaerobic conditions

75  
Azadi Ka  
Amrit Mahotsav

Let's build a better future,  
full of love, unity and  
understanding.



## Brain Teasers



- ☉ I left my campsite and hiked south for 3 miles. Then I turned east and hiked for 3 miles. I then turned north and hiked for 3 miles; at which time I came upon a bear inside my tent eating my food! What colour was the bear?
- ☉ A woman shoots her husband. Then she holds him under water for over 5 minutes. Finally, she hangs him. But 5 minutes later they both go out together and enjoy a wonderful dinner together. How can this be?

For Answers, Please refer to page no. 12

## 01

# TAWANG MONASTERY, ARUNACHAL PRADESH



Located amidst the picturesque surroundings, the Tawang Monastery also known as the “Golden Namgyal Lhatse” is one of the gems in Arunachal Pradesh. Perched at the height of 10,000 feet above sea level amidst the Himalayan ranges, it offers a breath-taking view of the Tawang-Chu valley

Tawang Monastery, located in Tawang city of Tawang district in the Indian state of Arunachal Pradesh, is the largest monastery in India. It is situated in the valley of the Tawang Chu, near the small town of the same name in the northwestern part of Arunachal Pradesh, in close proximity to the Chinese and Bhutanese border.

It radiates Buddhism and has natural beauty and serenity. It is surrounded by lakes and is the home to the Monpas, a community in Arunachal Pradesh. Tawang Monastery - Arunachal Pradesh Being the biggest monastery in India (2nd in Asia), Tawang Monastery houses more than 300 monks and is the most visited place in Tawang.

## 02

# ALLEPPEY (KERALA'S BACKWATERS)



Alappuzha (Alleppey) is known as 'the Venice of the East'. This charming place is the hub of Kerala's backwaters and is the picture-perfect place known for its beautiful backwaters and the houseboats offering overnight stays. The houseboats you find in the backwaters of Alappuzha are in fact a reworked version of the Kettuvallams of olden times. The coastline of Alleppey offers some of the best beaches in Kerala with water sports during the dry season.

There are plenty of houseboats, homestays, and rejuvenating Ayurvedic resorts that make staying in Alleppey brilliant. The houseboats pass through the serene backwaters, where you can catch glimpses of green paddy fields, choir-making activities, and witness the life of locals in Kerala.

Be sure to catch a traditional snake boat race in the months of August and September and try out some toddy (palm wine) at a local toddy shop for adding a touch of authenticity to your travel experience in Alleppey.

# Did you know?

## THE AVERAGE BEAR WILL HAVE 42 TEETH.

Each adult bear will have a total of 42 teeth. This includes 4 prominent and curved canine teeth, 12 incisors, 16 premolars, and 10 molars. The claws on the bears' feet are relatively shorter than their teeth.

After eating them, they will digest it again like normal food. Rabbits have two kinds of droppings, little black round ones and softer black ones known as cecotropes. The cecotrope droppings are the ones that they eat, and they do this so they can re-absorb any undigested nutrients from their food. This process is normally done once a day.

## BIRDS REQUIRE GRAVITY TO SWALLOW.

Birds cannot chew their food and instead swallow their prey whole. The esophagus of a bird is wide enough to swallow larger meals. They depend on gravity to push their food down the esophagus and then later be propelled into their stomachs.

## DID YOU KNOW THE TWITTER BIRD HAS A NAME?

It's Larry! The infamous bluebird of social media was named after former NBA player Larry Bird, who used to play for Twitter co-founder Biz Stone's home-state team, the Boston Celtics.

## DID YOU KNOW YOU CAN GET YOUR EYEBALLS TATTOOED?

If you're looking to get your entire body tattooed, you don't need to stop at your eyeballs! Many hardcore tattoo fans are getting the whites of their eyes injected with ink of all kinds of colors ranging from green to purple. However, there are some risks involved such as pain and prolonged blurred and double vision.

## BUBBLE WRAP WAS ORIGINALLY INVENTED AS WALLPAPER.

If you can't wait to pop every air-filled pocket the minute you pull a piece of bubble wrap out of a package, can you imagine how irresistible it would be if it were covering your walls? Engineer Al Fielding and Swiss inventor Marc Chavannes probably didn't consider that when, in 1957, they invented bubble wrap while trying to create a textured wallpaper by sealing two shower curtains together to trap air bubbles.

## Brain Teasers Answers

- 🌀 White. The only place you can hike 3 miles south, then east for 3 miles, then north for 3 miles and end up back at your starting point is the North Pole. Polar bears are the only bears that live at the North Pole, and they are white
- 🌀 The woman was a photographer. She shot a picture of her husband, developed it, and hung it up to dry.



DAY 1



Annual Meet Extravaganza at Kolkata, 6<sup>th</sup> to 9<sup>th</sup> April 2022.

The gala meet was the culmination of a series of events celebrating many milestones breached and new records set, the special one being crossing INR 1 billion in sale. The 4-day event was a time of soaking ourselves in all festivities, setting our sights on new benchmarks, charging ourselves up to take a Quantum Leap in the new year and making it a momentous one.

Putting together our goals, the brainstorming discussions focussed upon the key issues to provide direction to our team. Planning time-bound agendas to improve the performance of our team, to establish a clear and collaborative vision to help cement the organizations values and guiding rightfully to propel our team to attain its objectives. Our performers at the 'Got Talent' show, lit the stage on fire with their amazing performances.

DAY 2

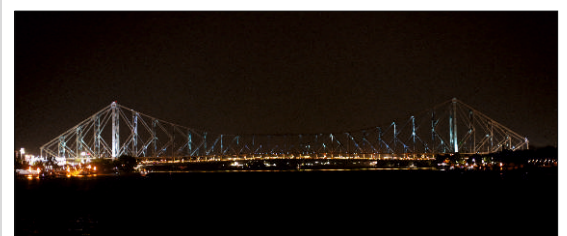


DAY 3



Neuro Linguistic Program (Team Building); the training session helped our team to introspect their individual abilities to improvise and strive to have a clear vision towards their goals. The whole team had performed several activities with their best efforts and enthusiasm.

Motivational session to enhance effective planning and team approach to the market through NLP training to the Provet team. Inputs for improved coverage and market penetration to increase activity in line with current industry trends.





## Digha Seminar - 15<sup>th</sup> & 16<sup>th</sup> April, 2022

Provet participated as a Diamond Sponsor in the 21<sup>st</sup> Biennial State Convention of West Bengal Veterinary Alumni Association's Seminar held at Digha, West Bengal.

## Moyna Aqua Expo - 22<sup>nd</sup> & 23<sup>rd</sup> April, 2022

Provet participated in Aqua Expo held at Moyna, Purba Medinipur, West Bengal. The knowledge transfer was given to the total attendance of 2500+ visitors in those two days.



## Seminar at Krishna Gunj, Nadia - 8<sup>th</sup> May, 2022

Provet sponsored and was present during the workshop on "Employment Generation of Livestock Farmers" organised by Progressive Veterinary Doctors' Association (PVDA) at Krishnaganj, Nadia, W.B. Around 202 farmers, the Savapati, BDO, Karmadhakshyas and others were present during the event.

## Bovinova Products Training at Kolkata - 18<sup>th</sup> - 21<sup>st</sup> May, 2022

Product refreshment training program for the existing and the newly joined employees of Bovinova Team was organised.



## Pharmaceutical Meet at BCKV, Haringhata, West Bengal - 9<sup>th</sup> July, 2022

Provet imparted product knowledge and distributed product brochures and gifts to the outgoing students of Bidhan Chandra Krishi Vishwavidhyalaya.

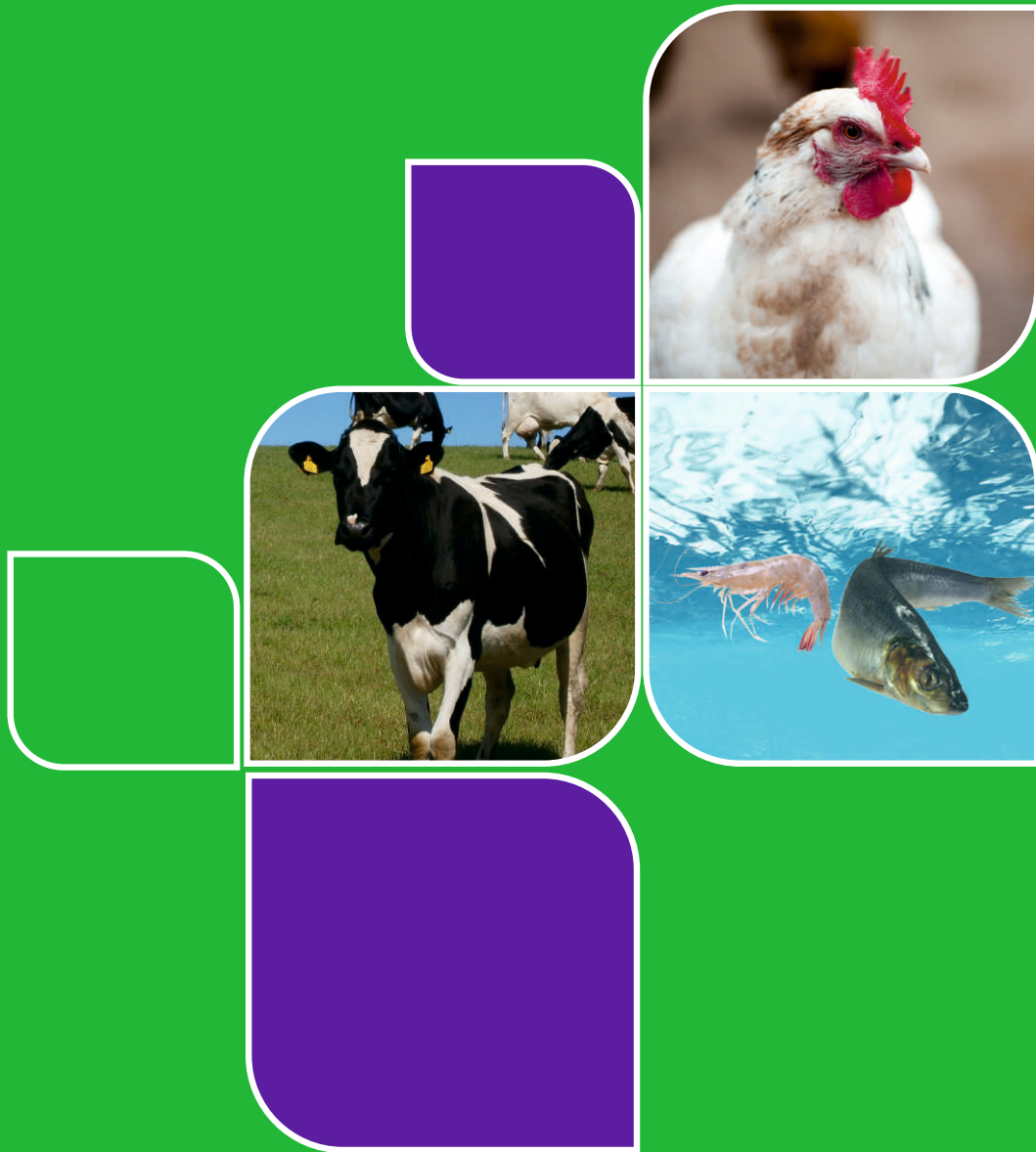
## Customers Group Meeting at MIMUL, Debra, Midnapore on 20<sup>th</sup> July, 2022

The meeting was held for farmers of Midnapur Milk Union Limited to promote our brands and widen the reach to the end users.





*Excellence through Innovation*



# Provet Pharma Private Limited

Serving Mankind Through Animal Welfare



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