

CLOSTAT™

The Active Microbial for a Natural solution

CLOSTAT contains Kemin's patented and proprietary strain of *Bacillus subtilis* PB6, isolated from healthy chicken gut. (US Patent 7,247,299)

CLOSTAT is an active microbial with a direct killing effect on *Clostridium perfringens* bacteria, which causes Necrotic Enteritis in poultry. CLOSTAT can effectively replace Antibiotic Growth Promoters (AGPs).

Special Features

- ▶ CLOSTAT has a definitive killing mode of action against *Clostridium perfringens*
- ▶ CLOSTAT stimulates the growth of other commensals bacteria also
- ▶ CLOSTAT is thermostable
- ▶ CLOSTAT is compatible with the commonly-used feed additives like AGPs, coccidiostats and organic acids in poultry feed
- ▶ CLOSTAT does not cause resistance issues
- ▶ No residues in meat and hence no withdrawal period is required
- ▶ CLOSTAT replaces AGPs

Effect of CLOSTAT on clostridium inhibition



Other *Bacillus subtilis*
clearly shows no inhibition

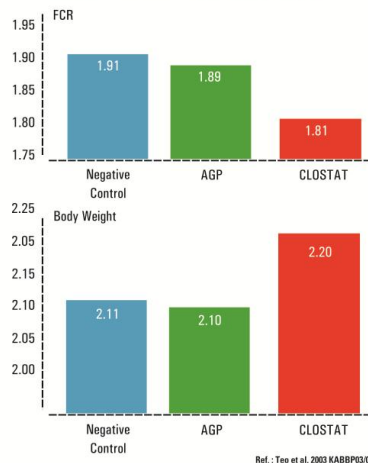
CLOSTAT
shows clear inhibition

Uniqueness of CLOSTAT

CLOSTAT grows rapidly as compared to other *Bacillus subtilis* organisms

CLOSTAT produces antimicrobial substances which are active against *Clostridium perfringens*

Effect of CLOSTAT on FCR & Body Weight



Benefits

- ▶ Prevents Necrotic Enteritis
- ▶ Improves intestinal health
- ▶ Improves weight gain
- ▶ Lowers FCR
- ▶ Improves immunity

Inclusion Rate

CLOSTAT 11 dry @ 0.5 to 1 Kg/ton of feed
CLOSTAT 12 dry @ 0.1 to 0.2 Kg/ton of feed

Presentation

25Kg bag



Peace of Mind



CLOSTAT™

The Active Microbial for a Natural Solution

Intestinal Health Management

Feed contributes to more than 70% of the expenses associated with egg and broiler production. Maintaining the gastro intestinal tract in a healthy state ensures better absorption of nutrients and keeps the intestinal bacteria at an optimum number.

Kemin has taken Intestinal Health Management to a new level with the development of CLOSTAT. Following extensive research, CLOSTAT is the first health product to be categorized as an active microbial. CLOSTAT helps in maintaining intestinal integrity by helping the intestine to maintain the microbiota at an optimum level. This ensures the better digestion and absorption of nutrients and better performance, which gives you PEACE OF MIND.



INSPIRED MOLECULAR SOLUTIONS™



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Healthy Intestine Leads to Best Performance

The gastrointestinal tract of an adult chicken is inhabited by up to 10^{12-14} bacteria. The microbial populations grow rapidly. The abundance of bacteria is affected by feed composition and ingredients.

Factors Responsible for Disrupted Intestinal Health

I. Infectious

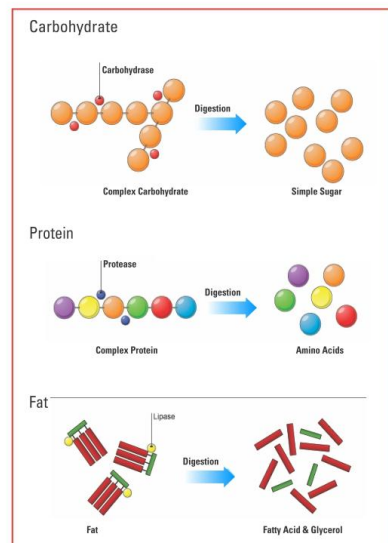
Disease : Coccidia infections, Bacterial infections and viral infections

II. Non infectious

- Feed :Structure and pellet quality, palatability, formulation and content, mycotoxins
- Management: Available feeder space, water space, distribution of feeders, drinkers, air quality

Importance of Intestinal Health

All the nutrients provided to the bird are broken down, digested and absorbed in the intestine.

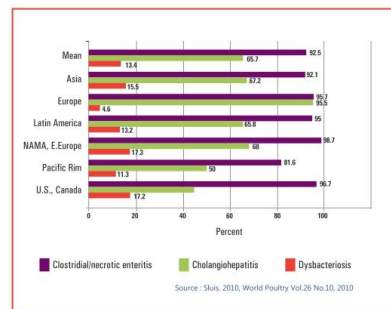


For the digestion and absorption of carbohydrates, protein, fat and other nutrients - healthy intestine plays a vital role.

Bacterial Enteritis

Intestinal health issues often arise, resulting in an overgrowth of Clostridium perfringens that leads to bacterial enteritis.

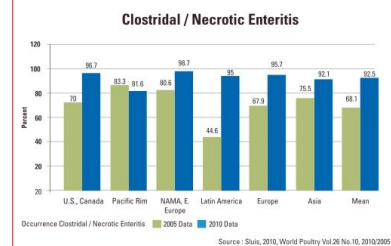
Bacterial enteritis presents itself in either one of the following three forms: Clostridial/necrotic enteritis, Dysbacteriosis, Cholangohepatitis. The occurrence of different forms of bacterial enteritis globally, is presented here.



Necrotic Enteritis

- Necrotic enteritis was known over 40 years ago.
- Many years, it was of minor economic importance
- Necrotic enteritis is considered to be one of the most threatening and reemerging disease in the broiler industry
- Necrotic enteritis in its subclinical form, causes high economic impact
- It is characterized by poor digestion, reduced weight gain and increased feed conversion ratio, without obvious increase in mortality.

Global Prevalence of Clostridial Enteritis



Mind Your Steps

While walking inside the poultry sheds, looking for the condition of the droppings give the better idea about the intestinal health of the birds.

Normal Droppings - Regular Consistency

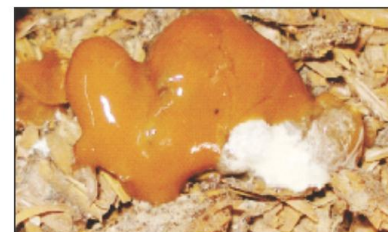


Intestinal droppings

Droppings Indicative of Necrotic Enteritis



Frothy, foamy droppings



Caecal droppings



Limited but high fluid zone

Economical Impact of NE - 1Lakh Broiler Replacement

Parameters	Normal	NE	Difference	Loss per week (₹)
Feed intake in gm	3900	4060	160 grams	2,08,000
FCR	1.95	2.03	+8 points	-
Body weight	2000	2000	-	-
Mortality	4%	5%	-1%	13,500
Total				2,21,500
Loss per bird				₹ 2.20

Ref : Kaldhusdal, & Atle Lovand,

Global economical losses estimated over \$2 billion per annum. In India the losses are estimated to the tune of ₹ 2.2 per bird.

Existing and Alternate Solutions

- Usage of Antibiotic Growth Promoters (AGPs) is known for more than five decades. Due to the indiscriminate usage of AGPs which leads to resistance in both animals and humans, governments all over the world have either started banning them or are advocating to reduce the usage of AGPs in food producing animals.
- The alternate solution available to prevent this issue is use of an Active Microbial.

Active Microbial

- Intestinal colonization of beneficial bacteria (*Lactobacillus*, *Bifidobacterium*, *Bacillus subtilis*) is important to keep the animals healthy.
- Active microbial - The bacteria with specific killing action on pathogens, by producing antibacterial substances with high safety margin.