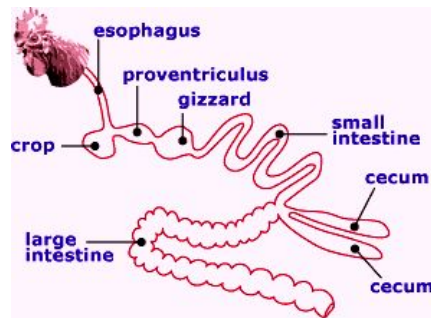


PROGUT-P

Gut Probiotic Blend



SALIENT FEATURES OF PROGUT

- Acidifies the Gut
- Acts as Immuno Modulators
- Antiallergenic
- Anticarcinogenic
- Antidiarrhoeal
- Antioxidant
- Eliminates enteropathogenic and enteroinvasive microbes by domination.
- Controls odour problems.
- Environment friendly
- Fights Candida, E Coli., Salmonella
- Imparts Disease Resistance Power.
- Improves digestion and absorption of Nutrients.
- Improves FCR
- Lowers pH in the small intestines.
- Maintains natural Flora
- Reduces Ammonia and Nitrites in the litter
- Reduces Crop Time
- Reduces quantity of Litter
- Reduces the incidence of Fly and Maggot menace.
- Reduces the need of Antibiotics.
- Reduces Wet Litter
- User friendly

CONTENTS AND MODE OF ACTION

Bacillus licheniformis

- Produces Enzymes like Keratinase which degrades waste and chitinous exo skeletons of the shrimp dead.
- Produces antibiotics like Bacitracin which suppress the growth of pathogenic microbes.

A feeding trial was conducted to investigate effects of *Bacillus licheniformis* on growth performance and meat quality of broilers. Nine hundred one-d-old broiler chicks were randomly assigned to 3 experimental groups with three replicate pens of 100 broiler chicks. Three treatments were i) control, ii) basal diets supplemented with 1 ml of *B.*

licheniformis for each in feed water per day iii) basal diets supplemented with 2 ml of *B. licheniformis* per chick in feed water per day. The supplementation of *B. licheniformis* significantly increased body weight in grower chickens ($p < 0.05$), and significantly improved the feed conversion in 3 to 6 and 0 to 6 wk feeding period compared with the control group ($p < 0.05$). Additionally, the supplement also resulted in increased protein and free amino acid contents, and decreased fat content in chicken breast fillet ($p < 0.05$). Furthermore, improvement in sensory attributes was observed in broilers fed with the probiotic. In conclusion, *B. licheniformis* treatments resulted in a significant increase ($p < 0.05$) in broiler productivity based on an index taking into account daily weight gain and feed conversion rate. Meanwhile, the probiotic contributed towards an improvement of the chemical, nutritional and sensorial characteristics of breast fillet. Overall, the study indicates that *B. licheniformis* can be used as a growth promoter and meat quality enhancer in broiler poultry.

(<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4093119/>)

In another trial with piglets (Kyriakis et al., 1999), addition of probiotics originating from *Bacillus licheniformis* to a control diet improved average daily weight gain as well. Moreover, the incidence and severity of diarrhoea as well as mortality rate were significantly decreased in a study by Kyriakis et al. (1999) (<http://www.thepoultrysite.com/articles/1564/probiotics-in-poultry-and-pig-nutrition-basics-and-benefits/>)

Bacillus megaterium

- Produces digestive enzymes which decompose excessive organic waste in the pond and helps to maintain the pond water medium clean. Very useful in inhibiting growth of *Vibrio* spp.

Bacillus polymyxa

- Produces large quantities of enzymes like amylases which digest many types of carbohydrates, proteins and lipids in aquatic environment.
- Produces Antibiotic Polymyxin which suppress the growth of pathogens. Helps in degrading organic waste and in solubilising phosphates.

The wide ranges of applications of *P. polymyxa* in industry are due to secondary metabolites produced by this bacterium. The antimicrobial compounds are effective against a wide range of Gram-positive and Gram-negative bacterial species therefore the bacteria can be used in biopreservation of food and medical applications.

Metabolites such as polymyxin E1 and a lantibiotic also decrease the colonization of pathogens in poultry and shrimp larvae

[Lal, S. and S. Tabacchioni. 2009. Ecology and biotechnological potential of *Paenibacillus polymyxa*: a minireview. Indian Journal of Microbiology. 49(1): 2-10]

Bacillus subtilis

- Produces many enzymes which help in decomposing excessive organic waste in the ponds.
- Forms a symbiotic relationship with the hosts in the slime layers of aquatic animals.

- Suppresses growth of undesirable microbes in the medium and as well over the host and inside the gut.
- Helps in denitrification by converting Nitrate into Oxygen and Nitrogen.
- Grows in a wide range of temperatures and pH from 5.5 to 10.

B. subtilis is considered by EFSA to be suitable for the qualified presumption of safety (QPS) approach to establishing safety for the target species, consumers and the environment. This approach requires the identity of the active agent to be established and the absence of toxigenic potential and susceptibility to a selected range of antibiotics to be demonstrated. No evidence of a toxigenic potential or resistance to antibiotics of human and veterinary importance was found as judged by the current guidelines. Consequently, the strain of *B. subtilis* in the additive is presumed safe for target animals, consumers and the environment. This conclusion covers the use of the additive in feed for laying hens and minor poultry species for laying. Use of the additive in feed for laying hens and minor poultry species will not introduce hazards for users not already considered.

Benefits for egg production

All four trials made with laying hens showed some evidence of a beneficial effect of the additive on egg production when used at a minimum dose of 1×10^8 CFU/kg complete feed, by increasing laying rate or average egg weight. The FEEDAP Panel concludes that *Bacillus subtilis* PB6 shows some potential to be efficacious in laying hens. This conclusion on efficacy for laying hens can be extended to minor poultry species raised for laying when the additive is used at the same minimum dose.

(<http://www.worldpoultry.net/Layers/Housing/2015/1/EFSA-Bacillus-subtilis-safe-for-layer-chicken-diets-1682936W/>)

Lactic acid bacillus

- Produces enzymes like Amylases, Phytases, Proteases and Lipases and also adequate B complex vitamins which help in reducing the pH and in preventing pathogens .

As reported by Berchieri et al. (2006), a combination of different lactic acid bacteria significantly reduced the levels of Salmonella enteritidis in caecal contents of broilers which had been orally inoculated with the pathogen.

(<http://www.thepoultrysite.com/articles/1564/probiotics-in-poultry-and-pig-nutrition-benefits/>)

Lactobacillus acidophilus

- They produce lactic acid as a main product from carbohydrates.
- Produces enzymes like amylases, phytases, proteases and lipases and also adequate B complex vitamins which help in reducing the pH and in preventing pathogens .
- They are able to act to help destroy hostile invading bacteria by producing natural antibiotic substances.
- They are able to help lessen the proliferation of hostile yeasts such as candida albicans. When the intestinal micro flora is disturbed (the lactobacilli can be adversely affected) under the influence of oral antibiotic therapy, or stress conditions, the use of supplemental acidophilus, in food or concentrated form, can reverse such negative

processes. The regular use of acidophilus bacteria as a supplement or in food is a protective means against imbalance of the intestinal micro flora.

- They are able to help reduce the level of cholesterol thus lessening the dangers of cardiovascular complications.
- They are able to suppress undesirable micro-organisms in the intestine, by some competitive means like creation of lactic acid and other inhibitory substances.
- They enhance and allow digestion of milk sugar (lactose) by producing the enzyme lactase and generally aid in the digestion of nutrients.

Acidophilus and other lactic bacteria have been found to possess marked inhibitory properties against intestinal pathogens as well as food spoilage organisms. Selective inhibition has been attributed in part to the ability of lactic acid organisms to produce [natural antibiotics](#). Lactobacillus Acidophilus specifically has been reported as producing antibiotics, notably acidophillin, lactolin and acidolin.

The acidolin production together with the lactic acid production is responsible for the excellent anti- microbial activity against enterpathogenic organisms including [E.coli](#), Klebsiella, pneumoniae, [Salmonella](#) typhimurium, Staphylococcus aureus, Clostridium perfringens, Pseudomonas aeruginosa (green diarrhea), Shigella paradysenteriae ([New Castle](#)), and against sporeformers. Further, it is active against polio virus (type 1).

Inhibition of pathogens by lactobacilli also is attributed to their alteration of pH through acid production. Because of their extensive fermentive capacity, lactic acid bacteria produce significant amounts of metabolic products including acetic, formic, and lactic acids, the inhibiting properties of which are well recognized.

Lactobacilli changes the oxidation-reduction potential through its production of metabolites. By making the environment less conducive for organisms requiring oxygen this action of the lactobacilli contributes to the overall inhibiting effect of these bacteria. Another means by which lactobacilli may retard growth of other micro-organisms is through nutrient depletion (competitive antagonism). Differences in metabolic activities make it possible for an organism to exhaust an essential nutrient from a growth medium and thus inhibit growth of other bacteria. In this respect Lactobacillus Acidophilus is very effective.

(<http://beautyofbirds.com/Lactobacillus.htm>)

Lactobacillus bulgaricus

- Produce natural antibiotic substances
- Enhances digestions of milk sugar by producing the enzyme lactase.
- Inhibits less desirable micro-organisms.

Hundred final stock Arbor Acres were used in this experiments, using Completely Randomized Design (CRD) with four treatments : R-0 - as control (0.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), R-1 (1.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), R-2 (1.5% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), and R-3 (2.0%

Lactobacillus bulgaricus and *Streptococcus thermophilus*); which was five times repeated. Results indicated that R-3 (ration that has supplemented with 2.0% *Lactobacillus bulgaricus* and *Streptococcus thermophilus*), has the highest carcass weight but the carcass fat content and the serum cholesterol carcass content was the lowest.

(THE EFFECTS OF *Lactobacillus bulgaricus* and *Streptococcus thermophiles* AS RATION SUPPLEMENT ON BROILER CARCASS WEIGHT, CARCASS FAT CONTENT AND THE SERUM CHOLESTEROL CARCASS CONTENT; Hendronoto Arnoldus W. LENGKEY and Lovita ADRIANI)

Lactobacillus casei

- Found to be effective in the treatment of certain intestinal conditions.

The mechanisms by which probiotic bacteria affect the immune system are unknown yet, but many of them are attributed to an increase in the innate or in the acquired immune response. To study the influence of the probiotic bacterium *Lactobacillus casei* in the expression of receptors involved in the innate immune response, this bacterium was orally administered to BALB/c mice. After, they were sacrificed; the small intestine and intestinal fluids were collected to measure secretory immunoglobulin A (IgA) specific for *L. casei*. Mononuclear cells from Peyer's patches were isolated to determine the CD-206 and TLR-2 receptors. In histological slices we determined the number of IgA⁺, CD4⁺, CD8⁺, and CD3⁺ cells and two cytokines (interleulin-5 [IL-5] and IL-6). CD-206 and TLR-2 increased with respect to the untreated control. We did not observe an increase in the T population or in the IL-5-positive cells. IgA⁺ cells and IL-6-producing cells increased after 7 days of *L. casei* administration. We did not find specific antibodies against *L. casei*. The main immune cells activated after oral *L. casei* administration were those of the innate immune response, with an increase in the specific markers of these cells (CD-206 and TLR-2), with no modification in the number of T cells.

(The Probiotic Bacterium *Lactobacillus casei* Induces Activation of the Gut Mucosal Immune System through Innate Immunity; C. Maldonado Galdeano^{1,2} and G. Perdigón; Clin Vaccine Immunol February 2006 vol. 13 no. 2 219-226)

Sacharomyces Boulardii

- Protects the Gastrointestinal Tract from Cholera.
- Alleviates Diarrhoea (especially when Diarrhoea is caused by *Clostridium difficile*, Crohns Disease and Travellers Diarrhoea).
- Acts as an Immuno modulator

Within a group of yeasts, *Saccharomyces boulardii* is considered a useful probiotic belonging to the genus *Saccharomyces*, and was first isolated from litchi fruit by Henri Boulard in the 1920s. A current finding revealed that oral administration of *S. boulardii* could improve intestinal health, induce innate immunity, and interact with resident microflora of intestine to protect the intestinal mucosa ([Kotowska et al., 2005](#)). Another study illustrated that *S. boulardii* could improve the ultrastructure of intestine and enhance protection against pathogens ([Mumy et al., 2008](#)). Meanwhile, it improves trophic factors activity such as nutrient transportation ([Buts et al., 1994](#)), modulates the host immune response, and exerts anti-inflammatory effects ([Ozkan et al., 2007](#)).

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Suggested Level of Inclusion:

Poultry:

In Feed: 750 g / Ton Feed once in a fortnight or 50-75 g/ MT Feed regularly

In Drinking Water: 1g/ 4 L of Water