

Empirical Data of Bioactive Peptides for Intestinal Health Products in Laying Hens

一、Research Background

The intestinal tract of laying hens is a core organ for nutrient digestion- absorption and immune defense. Its structural integrity and functional homeostasis are critical to sustaining laying hens' production performance, physical health and breeding benefits.

Under the large- scale breeding model, the intestines of laying hens operate under long- term high- load conditions, which are prone to a series of problems including impaired intestinal barrier, microecological imbalance, disrupted digestion and absorption, atrophy and shedding of intestinal mucosal villi, declined immune function and weakened mucosal immune barrier. These have become a core bottleneck restricting the high- quality development of the laying hen industry.

The pullet stage is a critical period for the rapid development of intestinal morphology and function in laying hens. The integrity of the intestinal mucosa and villus morphology directly determine nutrient absorption efficiency, which further affects the body weight, shank length and flock uniformity of laying hens, and ultimately governs their lifelong laying potential and total egg production. Meanwhile, the impact of intestinal health on laying performance is persistent. The homeostasis of intestinal microecology, barrier function and nutrient absorption efficiency during the laying period serve as core factors regulating laying rate and egg quality.

Intestinal dysfunction in laying hens not only makes it difficult to achieve the target laying peak and shortens the high-yield production cycle but also leads to deteriorated eggshell quality and an increased breakage rate, significantly reducing the economic profitability of poultry farming. Therefore, the precise prevention and management of intestinal disorders in laying hens is a core factor in enhancing the production efficiency of laying hen farming operations.

Product Introduction: Bioactive peptides are animal- derived endogenous bioactive factors developed based on synthetic biology technology. They can act on the intestines of laying hens in a targeted manner. By promoting intestinal development and repairing damage to intestinal epithelial tissues, they maintain the structural integrity and functional soundness of the intestines, effectively improve intestinal digestion and absorption capacity, strengthen the intestinal mucosal immune barrier, reduce the risk of intestinal diseases, fundamentally resolve various

intestinal- health issues in laying hens, and lay a solid foundation for the healthy breeding of laying hens.

二、Core Product Features

Bioactive peptides are applied throughout the whole breeding cycle of laying hens. Targeting the distinct growth and physiological characteristics of pullets and laying hens, they achieve multi- dimensional intestinal care and performance improvement. The core functions are as follows:

- Promote the maturation of intestinal development:** Activate the metabolism, growth, proliferation and differentiation of intestinal epithelial cells, accelerate the development of intestinal tissues, improve the structural integrity of the intestine, and consolidate the foundation of intestinal physiological functions.
- Repair intestinal damage:** Quickly repair intestinal epithelial tissue damage caused by various factors such as pathogen infection and breeding stress, and continuously maintain the integrity of the intestinal barrier.
- Strengthen intestinal immunity:** Improve the intestinal mucosal immune function, strengthen the intestinal mucosal immune barrier, effectively reduce the risk of infection by intestinal pathogenic microorganisms, and lower the incidence of intestinal diseases.
- Enhance feed absorption and utilization efficiency:** Promote the secretion of intestinal digestive enzymes, up- regulate the expression of nutrient transporters, and greatly improve the intestinal digestive and absorptive efficiency of various nutrients.

三、Field demonstration test data

Test 1: Growth Performance Trial of Young Laying Hens

Test subjects: 21- day- old laying hens, total of 18400 birds

Test groups: Control group and test group, with 9200 animals in each group

Test period: 35 days

Test protocol: The control group is fed the basal diet; the experimental group is supplemented with bioactive peptides at 50 g per ton of basal diet.

Test Results:

Detection indicators	Control group	Experimental group	Magnitude of improvement
21-day weight (g)	197.1	197.8	—

Body Weight (g) at 56 Days	705	738	+33g
Tibia length at 56 days (mm)	8.66	8.82	+0.16mm
56- day- old intestinal length (cm)	109	120	+11cm

Trial 2: Production Performance Test of Laying Hens

Test subjects: Laying hens, total of 76344

Test groups: Control group, Test group

Test period: 35 days

Test protocol: The control group is fed with basal diet; the experimental group is supplemented with 50 g/ton of bioactive peptides in the basal diet.

Test results :

Detection indicators	control group	test group	Magnitude of improvement
Inventory at 480- day age	38224	38120	
515- day inventory	38051	38005	+0.14
480- day egg- laying rate (%)	87.7	87.8	
515- day laying rate (%)	84.5	85.7	+1.1%
515- day egg weight (g)	61.5	62.1	+0.6
Feed- egg ratio	2.17	2.12	-0.05
Broken egg rate (%)	1.9	1.4	Decline35.7%

四、Comprehensive Product Efficiency- Enhancing Effect

Combined with multiple sets of experimental data, bioactive peptides can achieve stable efficiency enhancement for laying hens at different growth stages. The specific benefit indicators are as follows:

Rearing stage	Enhance effects	Improve
Young poultry stage	weight gain	3%-5%
	Tibia length growth	2%-3%
	Intestinal length	5%-8%
Laying- hen stage	Egg weight	1%-2%
	Egg- laying rate	1%-2%
	Broken- egg rate	Decline30%-50%
All- stage	Feed- egg ratio	Improve2%-4%

五、 Recommended Product Dosage

Applicable Stage	Recommended Dosage (g/ton of feed)
Pullet	50
laying hens	50