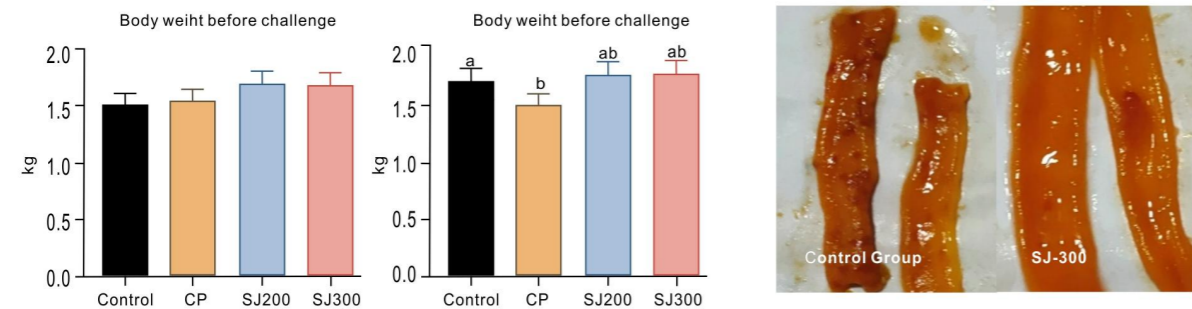


Research trial at Zhejiang A&F University, 24 head 28-day-old triple hybrid piglets were divided equally into 4 groups, 6 replicates each group. Clostide was pre-fed for 28days. Then challenge with LPS derived from E.coli. Taking sample 4h later. CON is control group, BL for 500 g/t Clostide II, LPS is LPS derived from E.coli with intraperitoneal injection of 100µg./kg, BL-LPS for 500 g/t Clostide II pre-fed for 28 days before intraperitoneal injection of LPS.

Pic2 Effect of Clostide II on weight gain in broiler chickens challenged by E.coli Pic 3 Effect of Clostide II on ileal health of broiler chickens challenged by E.coli



A total of 360 yellow-finned broilers of similar body weight at 1 day of age were selected and divided equally into 3 groups, grouped as follows: Control as the control group, CP as the E. coli challenged group, SJ200 and SJ300 as the Clostide pre-feeding and then E. coli challenged group. Firstly, 200 g/t and 300 g/t Clostide were pre-fed for 70 days, then 1.0×10^8 CFU Clostridium perfringens was gavaged, and the samples were collected after 5 consecutive days of gavage. The samples were collected after 5 days of gavage.

Clostide--Usage and dosage

Mix with complete feed (g/mt feed) .:

Species	Dosage	Species	Dosage
Breeding Pigs	300-500g/t	Poultry	200-300g/t
Suckling piglets	300-500g/t	Fish and shrimp	300-500g/t
Piglet	200-400g/t	Cattle and sheep	250-500g/t
Fattening pigs	200-300g/t	Special Animals	300-500g/t
Rabbit	250-500g/t		

CLOSTIDE

New breakthroughs in synthetic biology for antibacterial peptides

G+/G- Dual antibacterial comparable to antibiotics

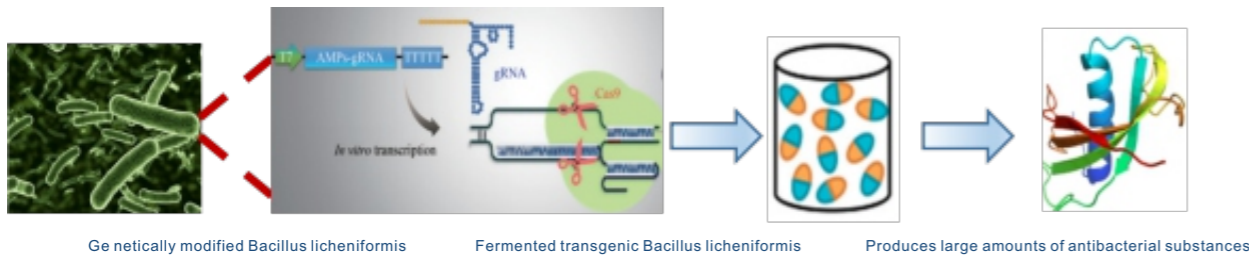


Clostride II, new antibacterial immunopeptide product developed by microbial fermentation using advanced synthetic biology technology.

- **Super antibacterial power:**the antibacterial power is comparable to antibiotics under recommended dose.
- **Very strong in negative bacteria:**especially for E. coli, Salmonella, Vibrio parahaemolyticus and other negative bacteria is very effective
- **Dual antibacterial for G-/G+:**Significant antibacterial effect on Clostridium perfringens and Staphylococcus aureus.
- **Green and Safety:**No resistance and no residue, green and safe.

Clostride--New antimicrobial peptide developed by synthetic biology technology

Clostride II is a novel antimicrobial immunopeptide product developed using advanced synthetic biology technology. By selecting stable Bacillus licheniformis and using CRISPR/Cas9 system to introduce Cas9 nuclease and specific RNA into Bacillus licheniformis to promote the secretion of ribosomal modified protein and lichenin and other antibacterial substances in large quantities, and after concentration and membrane filtration processes to obtain the finished product - Clostride.



Clostride II--Super antibacterial, green and residue-free, stable and resistant

Clostride II, Super antibacterial, comparable to antibiotics

Clostride II has a very significant antibacterial effect, diluting 1000 times still has a high sensitivity with an inhibition zone of more than 20mm against several harmful bacteria.

Table 1 Comparison of the inhibition zone diameter (mm) of Clostride II against several harmful bacteria at different dilution levels

	E. coli	Salmonella	Staphylococcus aureus
Dilution times	Inhibition Zone (mm) of Clostride diluted 1000 times against different bacteria		
Diameter (mm)	21	21	23
Pictures			
Dilution times	Inhibition circle size (mm) of Clostride diluted 5000 times against different bacter		
Diameter (mm)	18	18	13
Pictures			

Table 2 Antibacterial effect of clostride and mucilage sulfate on different pathogenic bacteria

Test samples	Clostride (diluted 1000 times)	Colistin Sulphate raw material (22646IU/g)	Clostride (diluted 1000 times)	Colistin Sulphate raw material (22646IU/g)	Clostride (diluted 1000 times)	Colistin Sulphate raw material (22646IU/g)
Disease-causing bacteria	E. coli		Salmonella		Staphylococcus aureus	
Diameter of inhibition circle(mm)	21	14	21	17	23	14
Pictures						

Stable and resilient

Clostride has good stability, after high temperature stability test and simulated gastrointestinal fluid test, the product has good resistance, suitable for use as feed additives.

Table 3 Comparison of inhibition circle size (mm) of several harmful bacteria before and after clostride treatment by high temperature water bath

Indicator bacteria	E. coli	Salmonella	Staphylococcus aureus
①Clostride (Before processing)	21	28	32
②Clostride 80°C after treatment for 10min	21	27	30
Antibacterial pictures			

Green and Safety:

The main active ingredients of Clostride are lichenin and ribosomal modified protein, both of which are natural metabolites of Bacillus licheniformis.

Both components are natural metabolites of Bacillus licheniformis and are highly safe. Clostride has been tested and verified by a third-party institution to be free of drug residue risk.



Clostride--Application Effect

- Inhibit harmful bacteria and significantly reduce the incidence of diarrhea in weaned piglets and watery stool in poultry.
- Regulate intestinal flora, enhance intestinal barrier function and strengthen immunity.
- Improve feed utilization and reduce FCR (Feed conversion ratio).
- Improve disease resistance and reduce drug costs.

Table 4 Effect of Clostride on growth performance and diarrhea rate of weaned piglets

Group	Control group	300g/t clostride group	500g/t clostride group
Average starting weight(Kg)	8.938	9.428	8.705
Average end weight(Kg)	16.482	19.045	17.521
Average daily weight gain(g)	269.0b	343.0a	315.1a b
Average daily feed intake(g)	475.0	569.0	524.0
Feed to weight ratio	1.765	1.656	1.664
Diarrhea rate, %	9.52a	7.54b	5.56b

In a farm user in Zhejiang, select 180 head 28-day-old Du x Chang x Da ternary crossbred weaned piglets were selected for the trial, using 500g/t Clostride group, diarrhea was reduced by more than 40%, significantly higher daily weight gain and lower feed to weight ratio.

Pic 1 Clostride improves intestinal barrier function in weaned piglets

