

FEED

Live Natural, Live New

Technologies inspired
by nature that gives back to nature!
Sustainable life and healthy Earth!
The philosophy that drives CJ YOUTELL



Live Natural, Live New

CJ YOUTELL possesses excellent strain improvement technologies and production platforms, which form the basis of the enzyme business. Furthermore, CJ YOUTELL have accumulated knowledge and expertise in the field of blending enzyme technology, which can provide customer-oriented tailored solutions. CJ YOUTELL, established by CJ's acquisition of Youtell, will become the global company that specializes in enzymes and realizes customers value with a differentiated portfolio, based on its excellent strain, biotechnology and solution capabilities.





CJ BIO OVER 60 YEARS

1953

Founded CheilJedang Co., Ltd. (the first manufacturing business of Samsung Group)

1973

Started the animal feed business

1988

Established the manufacturing plant in Indonesia

2005

Completed construction of powdered lysine plant in Liaocheng, China / Piracicaba, Brazil

2013

Completed construction of powdered lysine in Fort Dodge, US

2017

Launched CJ Blossom Park, an integrated research institute

2017

Selected as the official sponsor of the '2018 PyeongChang Winter Olympics'

2018

Sales of its global bio business exceeded KRW 2 trillion

2018

Completed construction of a production plant for fermented soybeans in Foshan, China

CJ YOUTELL OVER 20 YEARS

2000

Established company in Yueyang, Hunan province, China

2004

Construction of Yueyang Production Base in Hunan Province

2008

Shanghai YOUTELL Bio Chemical Company was established

2009

Established YOUTELL Biochem Co., Ltd. to conduct core technology research

2012

Constructed Shandong Jining Production Base and started production



MAIN INDUSTRY

FEED

We have improved productivity across all livestock species - including poultry, swine, bovine, and fish - by producing various single enzymes and customized complex enzymes.



FOOD

We have improved the efficiency of the production process and product quality through the addition of additives to the baking, brewing, and juice production processes.



TEXTILE

We offer differentiated products for the process of washing, desizing, and deoxygenating more efficient based on powerful cellulase, amylase, and catalase products.



PAPER

We have enhanced the processing efficiency by providing enzymes that help refine, size, and bleach paper, as well as adhesive enzymes and wood fiber softening enzymes.



DETERGENT

We manufacture detergents that are highly environmentally-friendly and usable under universal conditions.



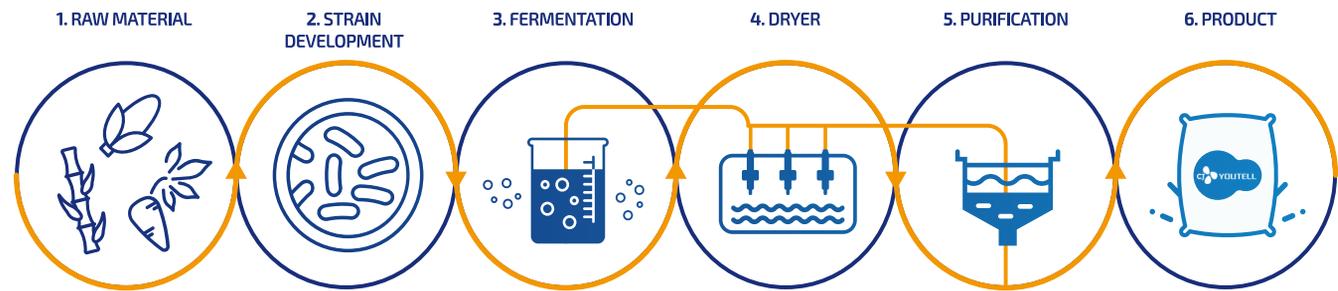


ADVANCED TECHNOLOGY

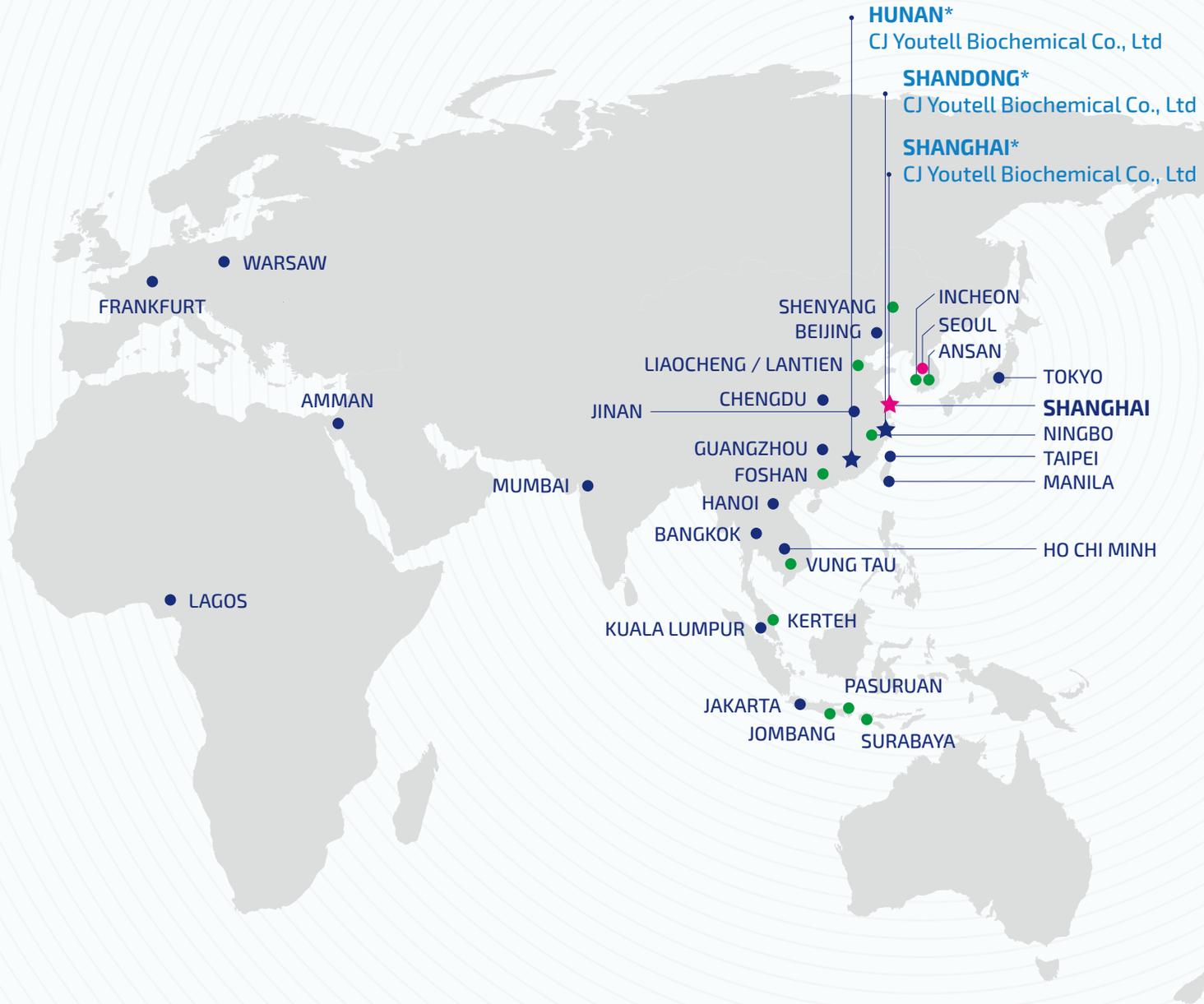
A World-Class Leading Green BIO Company

Having started out with its production of MSG in 1964, the company has enjoyed accelerated growth as it accumulated fermentation technology. We are now making effective use of our strain improvement and fermentation technology using microbial resources to produce and sell amino acid for feed and food, seasoning materials, and high vegetable protein materials. As a high-tech enterprise in biological preparation field, the company has a full of vitality, high-quality, younger and professional R&D team, which is the company's core technology power providing a steady stream of energy and power for the

development of company. The core technical staffs are all graduated from bioengineering, biochemistry, basic medicine, medical laboratory science, etc., with rich biological theoretical knowledge. The company created a series of R&D management system such as project responsibility system, cost accounting system, appraisal incentive system, talent growth system, and other scientific research management systems that greatly mobilize the enthusiasm and subjective initiative of scientific and technical personnel.



GLOBAL NETWORK





SEATTLE*
CJ Yutell (USA) Biochemical, Inc.

CHICAGO BOSTON

FORT DODGE

GUADALAJARA

GOIANIA PIRACICABA
SAO PAULO

CJ YUTELL GLOBAL NETWORK

R&D INSTITUTE
CJ Yutell (USA) Biochemical, Inc.
Shanghai CJ Yutell Biochemical, Inc.

SALES BRANCH
Hunan CJ Yutell Biochemical Co., Ltd
Shandong CJ Yutell Biochemical Co., Ltd
Shanghai CJ Yutell Biochemical Co., Ltd

-
- PLANT SITE
 - R&D INSTITUTE
 - SALES BRANCH
 - ★ CJ YUTELL

Best products
for your purpose

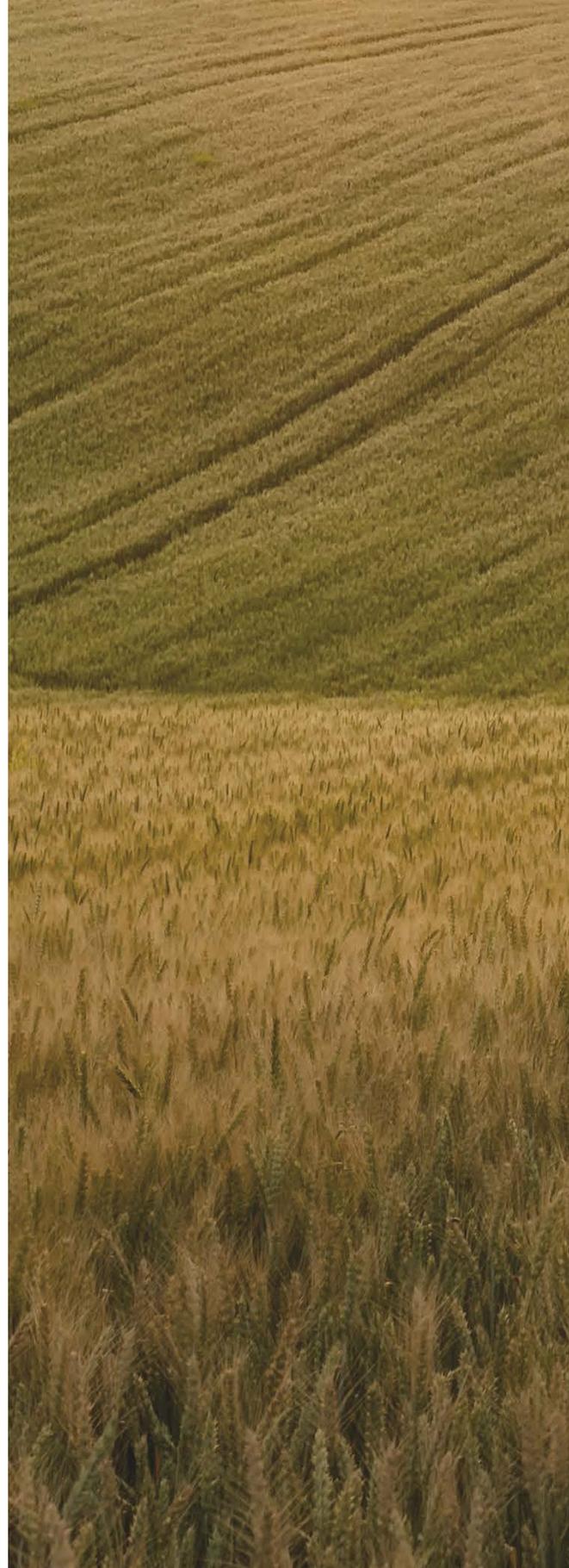
Part 1

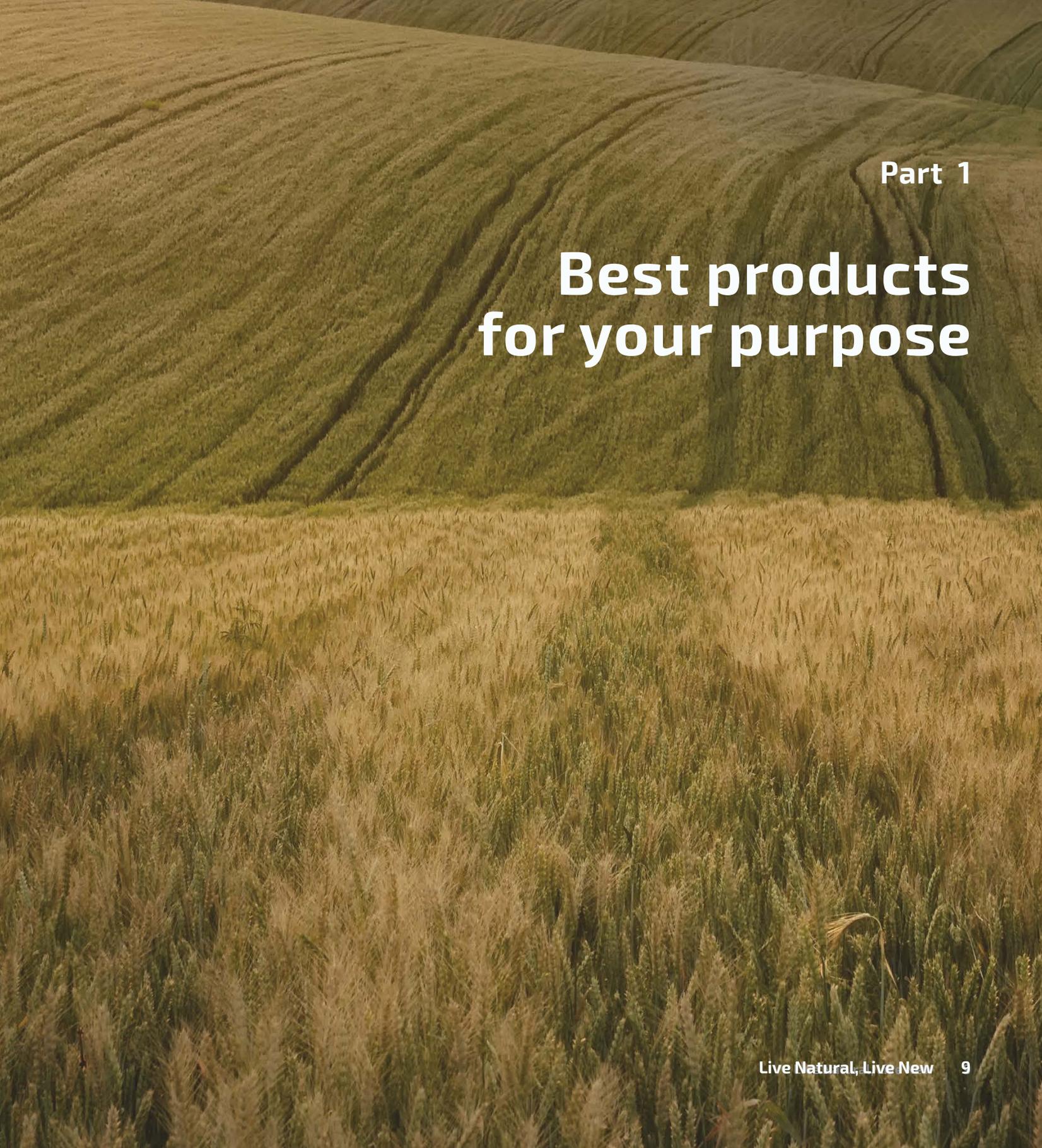
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Best solutions
for your animal species

Part 2

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Part 1

Best products for your purpose



Phytase

Phytase (*myo*-inositol hexakisphosphate phosphohydrolase) is any type of phosphatase enzyme that catalyzes the hydrolysis of phytic acid (*myo*-inositol hexakisphosphate)- an indigestible, organic form of phosphorus that is found in grains and oil seeds – and releases inorganic phosphorus and *myo*-inositol which are then absorbed in animal GIT.

Product specification

Type	FE609B	FE609C	FE609D	FE609BL	FE609CL	FE609DL	
Activity ¹	1,000 U/g	5,000 U/g	10,000 U/g	1,000 U/ml	5,000 U/ml	10,000 U/ml	
Physical form ²	Solid	Solid	Solid	Liquid	Liquid	Liquid	
Inclusion rate	Broiler	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t
	Layer	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t
	Piglet	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t
	Growing pig	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t
	Duck	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t	0.500-0.750 kg/t	0.100-0.150 kg/t	0.050-0.075 kg/t
	Aqua	0.600-0.800 kg/t	0.150-0.200 kg/t	0.060-0.080 kg/t	0.600-0.800 kg/t	0.150-0.200 kg/t	0.060-0.080 kg/t

¹Definition of phytase activity: One unit of phytase activity is defined as the amount of enzyme required to release 1 µmol of inorganic phosphorus per minute from sodium at 37°C, pH 5.5, which expressed as U.

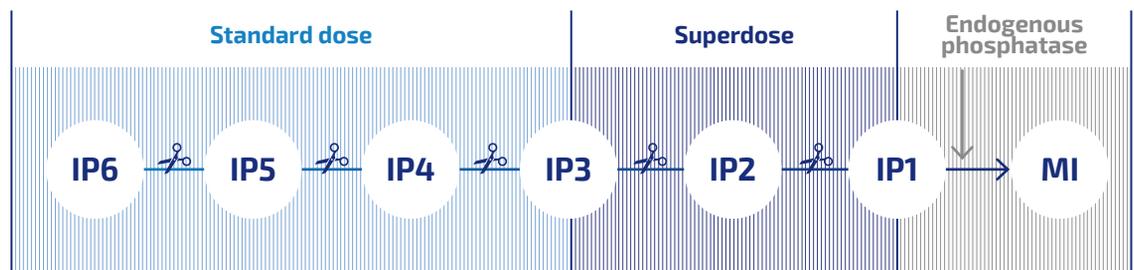
²The solid products are thermostable enzyme preparations.
CJ BIO provides customized activity for your needs.



Resists to high temperatures and humidity, and can be used in various feed pelleting processes



Significantly reduces phosphate content of animal excrement and therefore environmental pollution



 Phytase

Maximizing phytate breakdown by phytase superdosing :

Enable to break down phytate more efficiently by supplementing exogenous phytase at higher dose of 1,500 – 5,000 units/kg feed. Three to ten times higher compared to the traditional dosage (500-700 units/kg feed).

Xylanase

CJ YOUTELL Xylanase adds value to feed and farm animal performance, providing continuous and extensive benefits across the various species and feed types.

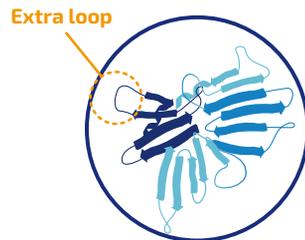
It is designed according to characteristics of monogastric animal digestive systems. The product, endo- β -1,4-xylanase, hydrolyzes the non-starch polysaccharide, xylan.

Product specification

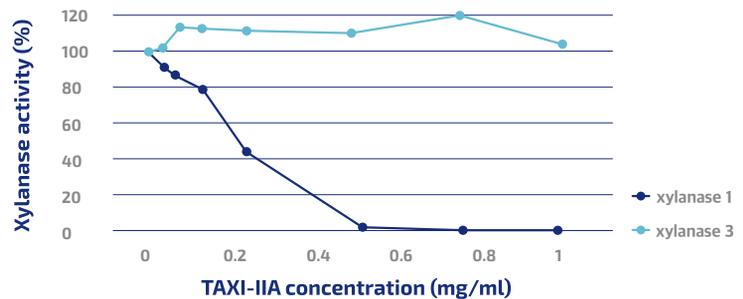
Type	FE504C	FE504D	FE504CL	FE504DL	
Activity ¹	30,000 U/g	50,000 U/g	30,000 U/ml	50,000 U/ml	
Physical form ²	Solid	Solid	Liquid	Liquid	
Inclusion rate	Broiler	0.067-0.100 kg/t	0.040-0.060 kg/t	0.067-0.100 kg/t	0.040-0.060 kg/t
	Layer	0.053-0.080 kg/t	0.032-0.048 kg/t	0.053-0.080 kg/t	0.032-0.048 kg/t
	Piglet	0.034-0.067 kg/t	0.020-0.040 kg/t	0.034-0.067 kg/t	0.020-0.040 kg/t
	Growing pig	0.067-0.134 kg/t	0.040-0.080 kg/t	0.067-0.134 kg/t	0.040-0.080 kg/t
	Duck	0.067-0.134 kg/t	0.040-0.080 kg/t	0.067-0.134 kg/t	0.040-0.080 kg/t
	Aqua	0.067-0.134 kg/t	0.040-0.080 kg/t	0.067-0.134 kg/t	0.040-0.080 kg/t

¹Definition of xylanase activity: The amount of enzyme required to release 1 μ mol xylose equivalent from 1.0% bagasse per min at 50°C and pH 6.5 is defined as one unit (U).

²The solid products are thermostable enzyme preparations. CJ BIO provides customized activity for your needs.



Inhibition curves of TAXI-IIA against xylanase 1 and 3



Special GH11 xylanase

Special xylanase has been developed to be protected from xylanase inhibitors by the extra loop with CJ Youtell's own biotechnology, Special GH11 xylanase is not inhibited by xylanase inhibitor protein (XIP).



Overcomes the dietary anti-nutritional factor xylan and reduce the viscosity of digesta as well as the incidence of diarrhea



Improves the utilization of xylan-rich feed ingredients while maintaining animal performance



Insensitive to XIP or TAXI inhibitor

β-Glucanase

β-Glucan which is found in most cereals consists of a linear chain of glucose units joined by both β-1,3 and β-1,4 linkages. CJ Youtell β-glucanase hydrolyzes the anti-nutritional factor, β-glucan, in feed and reduces the viscosity of digesta and diarrhea. Also, it promotes the growth of health-promoting bacteria in intestine.

Product specification

Type	FE303G	FE303GL
Activity ¹	20,000 U/g	20,000 U/ml
Physical form	Solid	Liquid
Inclusion rate	Broiler	0.020-0.030 kg/t
	Layer	0.016-0.024 kg/t
	Piglet	0.010-0.025 kg/t
	Growing pig	
	Duck	0.020-0.040 kg/t
	Aqua	

¹Definition of β-glucanase activity: One unit (U) of β-glucanase is the amount of enzyme which releases one μmol of glucose equivalent per minute as reducing sugar from 1.00 mg/ml of glucan solution under temperature 50°C and pH 4.8. CJ BIO provides customized activity for your needs.





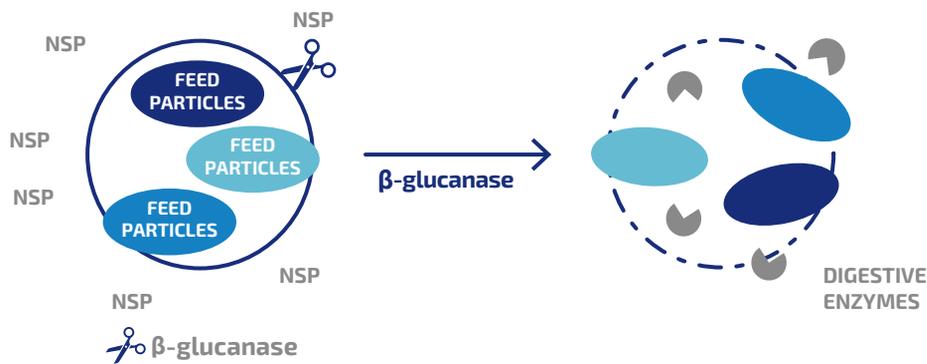
Efficiently hydrolyzes the anti-nutritional factor β -glucan in feed and reduces the viscosity of digesta as well as the incidence of diarrhea



Releases oligosaccharides from β -glucan and enhances growth of health-promoting bacteria in intestine



Extends the use of unconventional fiber-rich feed raw ingredients and therefore reduces feed cost



Increase nutrient utilization

β -glucanase can soften "cage effect" and release entrapped feed particles, thus increasing accessibility of endogenous digestive enzymes.



β-Mannanase

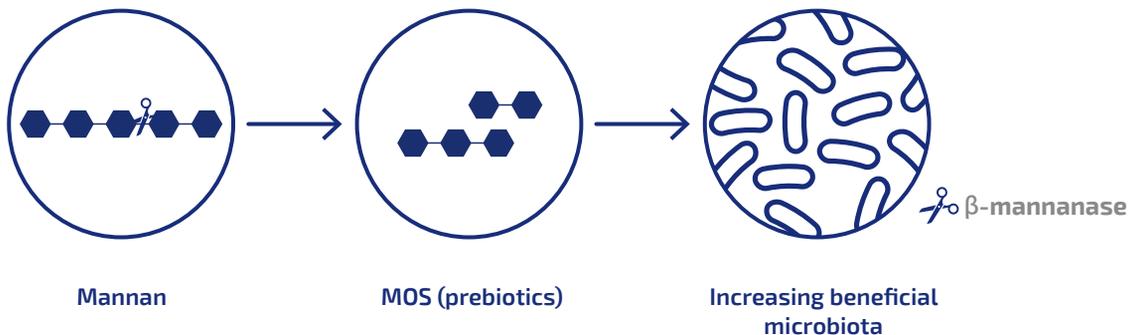
Mannan is part of the hemicellulose fraction in plant cell walls. β-mannanase randomly catalyzes β-D-1,4 mannopyranoside linkages in β-1,4 mannans into simple molecules like mannan-oligosaccharides and mannose. By eliminating the anti-nutritional factor mannan in feed, it can improve digestibility of legumes and increase nitrogen utilization.

Product specification

Type	FE406F	FE406FL
Activity ¹	20,000 U/g	20,000 U/ml
Physical form ²	Solid	Liquid
Inclusion rate	Broiler	0.010-0.015 kg/t
	Layer	0.008-0.012 kg/t
	Piglet	0.010-0.020 kg/t
	Growing pig	
	Duck	
	Aqua	

¹Definition of mannanase activity: The amount of enzyme required to release 1 μmol/ml of reducing sugar from 3 mg/ml mannan solution per minute under temperature 37°C and pH 5.5 is defined as one unit (U).

²The solid product is thermostable enzyme preparation. CJ BIO provides customized activity for your needs.



Boosting gut health :

β-mannanase hydrolyzes mannan to mannan-oligosaccharides (MOS)

1. MOS acts as favorable prebiotics for beneficial bacteria.

>> promoting the growth of beneficial bacteria

2. By combining with pathogens, MOS can reduce harmful bacteria such as *Salmonella* and *E.coli*.



Reduces the anti-nutritional factor, mannan, in feed ingredients and improve the digestibility of legumes, boost the immunity and antiviral ability and increase introgen utilization of the animals
Also, it reduces the need for antibiotic usage in feeds



Breaks down plant cell wall, and facilitates the release of nutrients in the plant cell and improve energy utilization



Reduces or avoids the compensatory renal growth and hypertrophy of digestive organs, and reduces the maintenance requirements of animals



Increases the utilization of by-product ingredients while maintaining animal performance and therefore reducing feed cost

Protease

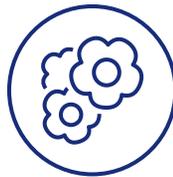
CJ YOUTELL Protease is the feed enzyme with advanced technology targeting crude protein and anti-nutritional factors such as glycinin and β -conglycinin in the diet. It breaks down proteins into peptides and amino acids. Its supplementation enhances the protein and A.A. digestibility.



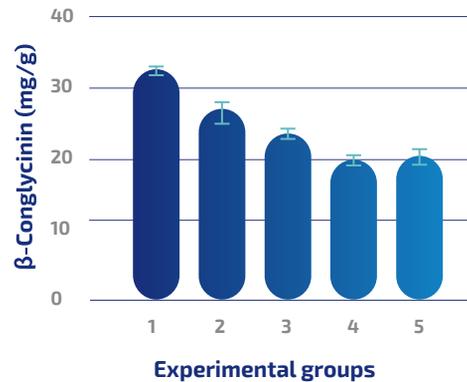
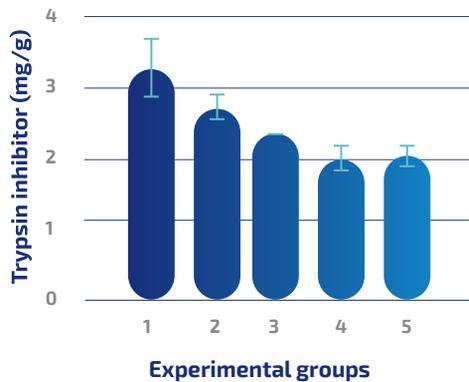
Product specification

Type	FE101A	FE101AL	FE101B	FE101BL	FE101C	FE101CL	
Activity ¹	50,000 U/g	50,000 U/ml	50,000 U/g	50,000 U/ml	50,000 U/g	50,000 U/ml	
Physical form	Solid	Liquid	Solid	Liquid	Solid	Liquid	
Inclusion rate	Broiler	0.010-0.020 kg/t	0.010-0.020 kg/t	0.010-0.020 kg/t	0.010-0.020 kg/t	0.020-0.040 kg/t	0.020-0.040 kg/t
	Layer	0.010-0.015 kg/t	0.010-0.015 kg/t	0.010-0.015 kg/t	0.010-0.015 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t
	Piglet	0.020-0.030 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t	0.040-0.060 kg/t	0.040-0.060 kg/t
	Growing pig	0.010-0.015 kg/t	0.010-0.015 kg/t	0.010-0.015 kg/t	0.010-0.015 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t
	Duck	0.010-0.020 kg/t	0.010-0.015 kg/t	0.010-0.020 kg/t	0.010-0.015 kg/t	0.020-0.040 kg/t	0.020-0.040 kg/t
	Aqua	0.020-0.030 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t	0.020-0.030 kg/t	0.040-0.060 kg/t	0.040-0.060 kg/t

¹The amount of enzyme required 1 µg/ml of L-tyrosine equivalent from casein by 1 g enzyme per minute under specific temperature and pH defined as one unit (U). Acid protease is analyzed at 40°C and pH 3.0, neutral protease is at 30°C, pH 7.5 and alkaline protease is at 40°C, pH 10.5.



Breaks down proteins into peptides and amino acids. CJ YOUTELL protease is effective on an acidic condition of pH 3.0 to alkaline condition at pH 10.5



Test diet

1. SBM
2. Sterilized SBM
3. S-SBM + 5 U enzyme
4. S-SBM + 10 U enzyme
5. S-SBM + 15 U enzyme

Reduced ANFs in soybean meal

CJ YOUTELL's alkali protease could efficiently reduce the anti-nutritional factors such as trypsin inhibitor, glycinin, and β-conglycinin in soybean meal.

Part 2

Best solutions for your animal species





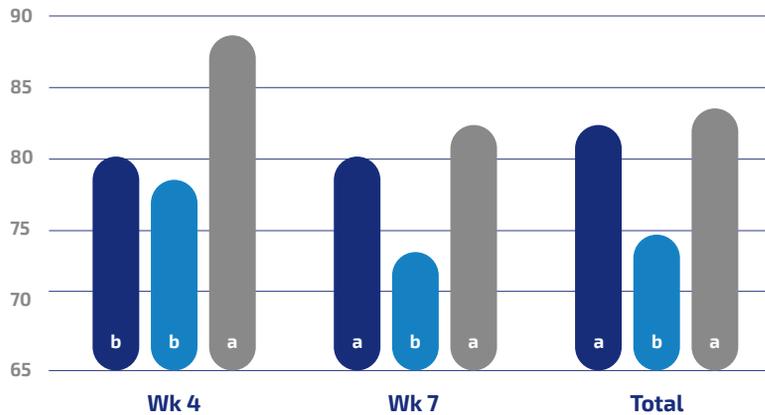
For Layer

By overcoming dietary anti-nutritional factors and reducing the viscosity of digesta, the supplementation of endogenous enzyme, FE808E, can save energy by 50-80 kcal/kg and increase the laying rate and average egg weight.

Composition

FE808E	Xylanase	Cellulase	β -Glucanase	α -Galactosidase	β -Mannanase	α -Amylase	Acid Protease
ACTIVITY (U/g)	14,000	1,400	2,200	300	1,000	800	4,000

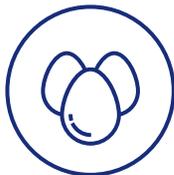
Laying late (%)



Trial report

- The effects of FE808E on laying rate was demonstrated on layer trials.
- FE808E diets showed improved laying rate compared to NC (-50 kcal/kg diet), and same results with PC (positive control).

● PC ● NC (-50 kcal/kg) ● FE808 (100 g/ton)



- Improves feed digestibility and egg production rate
- Targets several cell wall components to release encapsulated nutrients



- Improves gut health
- Breaks down anti-nutritional factors (trypsin inhibitor, raffinose, stachyose) and reduce the incidence of diarrhea



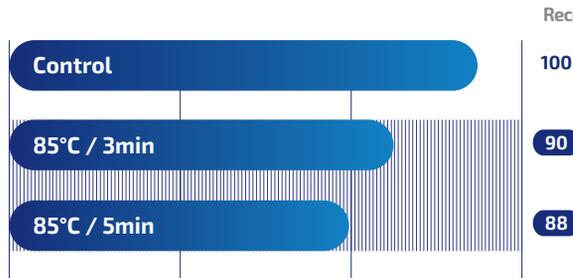
- Reduces feed cost through optimized nutrient availability, and offering flexibility in feed formulation

For Broiler

Expanding raw materials of formula diets, overcoming dietary anti-nutritional factors, and reducing the viscosity of digesta with stable diet quality that saves energy 50-80 kcal/kg

Composition

FE808B	Xylanase	Cellulase	β -Glucanase	β -Mannanase	α -Amylase	Acid Protease
ACTIVITY (U/g)	18,000	1,500	2,500	1,500	1,000	5,000



Trial report

- Compound enzyme for broiler, FE808B contains mainly xylanase.
- To achieve better performance, thermo-stability of xylanase is the key factor.
- At the temperature of 85°C for 5 min, the retention activity is 88%.



- Improves growth performance both corn and wheat-based, including more complex diets



- Provides probiotics and balances the gut microflora population to improve gut health
- Breaks down anti-nutritional factors and reduces the incidence of diarrhea



- Increases the availability of indigestible components in plant feedstuffs
- Provides more metabolizable energy



For Piglet

CJ YOUTELL FE906 enables piglets to adapt quickly to diets, overcome dietary anti-nutritional factors and reduce the incidence of diarrhea by decreasing the viscosity of digesta.



- FE906 efficiently improves growth performance in both corn/soy-based, high protein & energy diets



- Provides prebiotic sources and enhances the growth of health-promoting bacteria in intestine
- Breaks down anti-nutritional factors and reduce the incidence of diarrhea

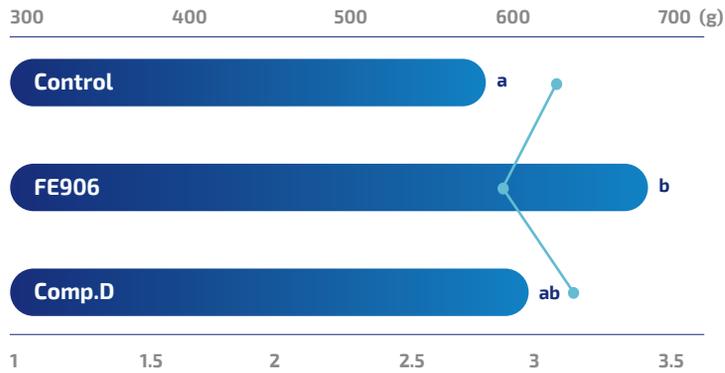


- Increases the availability of indigestible components in plant feedstuffs
- Provides more metabolizable energy



Composition

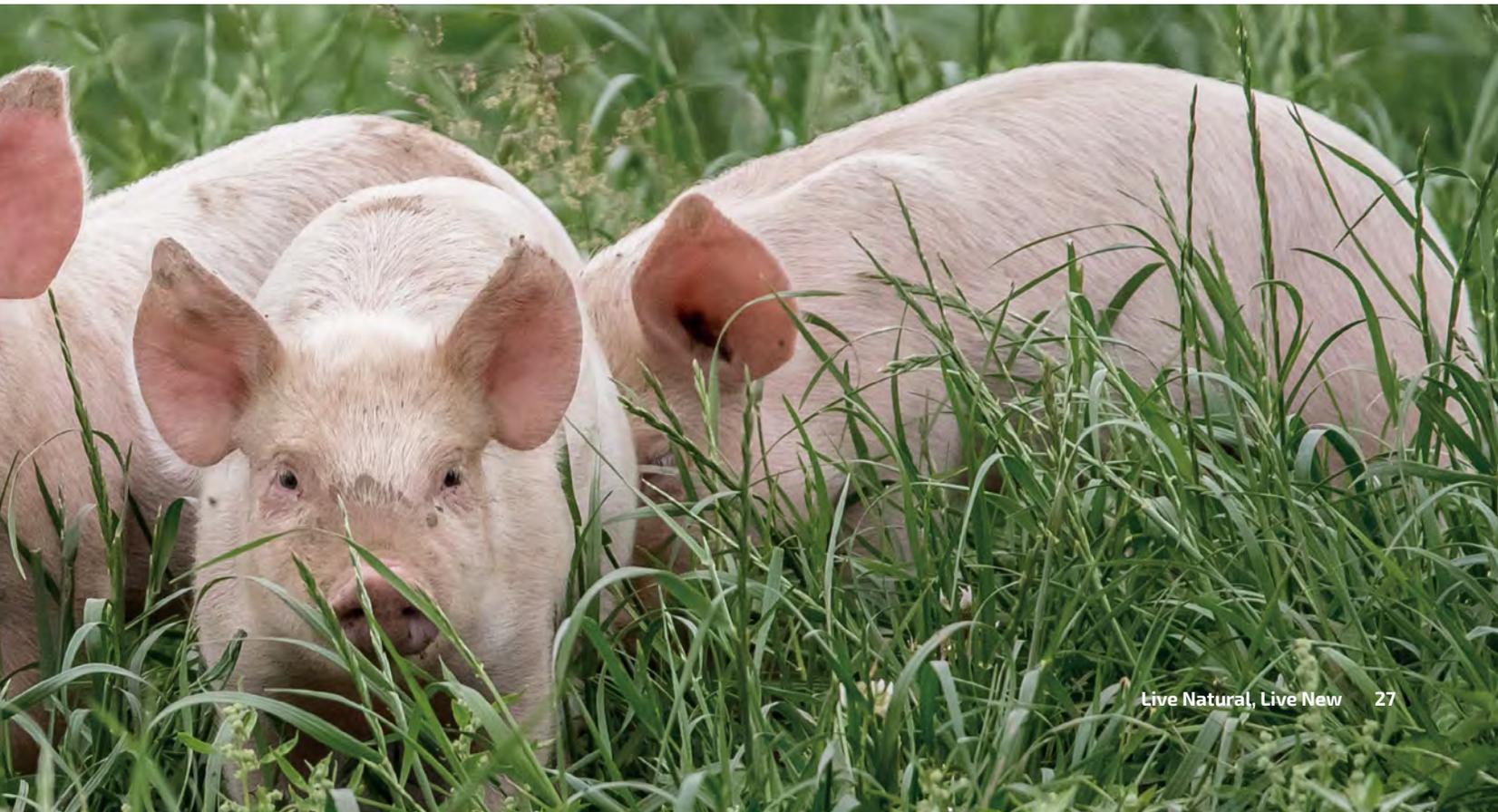
FE906	Xylanase	Cellulase	β -Glucanase	β -Mannanase	α -Amylase	Acid Protease	Lipase
ACTIVITY (U/g)	4,000	400	600	500	800	6,000	4,000



Trial report

- The effects of FE906 on growth performance was demonstrated in piglet trials.
- Results showed the ADG and FCR were improved due to the elimination of the NSPs in the corn-soybean meal diet.

● ADG (g) ◆ FCR





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