



Periodical Systems

ANIMALS BIOSYSTEM | TECHNICAL OVERVIEW

FORMULATION | MECHANISM | APPLICATION

Animals BioSystem

Biological feed additive

A technical guide to composition, biological pathways, research evidence, application and handling.

INTENDED CATEGORIES

Ruminants | poultry | young livestock | aquaculture

FORMULATION | MECHANISM | EVIDENCE | USE





01 FORMULATION

Formulation profile

The dry formulation contains one dominant beta-glucan fraction and a second group associated with intestinal and feed-utilization functions.

Beta-1,3/1,6-glucan

Innate immune-response fraction

55%

Amino acids + nucleic acids

Microbial and enzymatic activity

20%

Soluble polysaccharides, organic matter + lipids

Complementary organic fraction

15%

Inorganic salts + ash

Mineral and ash fraction

9.9%

ADDITIONAL COMPONENT DETAIL

The Chinese product reference also lists mannan oligosaccharides, 18 amino acids, nucleotides, trace elements and B-group vitamins.



02 FUNCTIONAL LOGIC

How the formulation connects to outcomes

The major formulation fractions connect to separate immune-response and feed-utilization pathways.

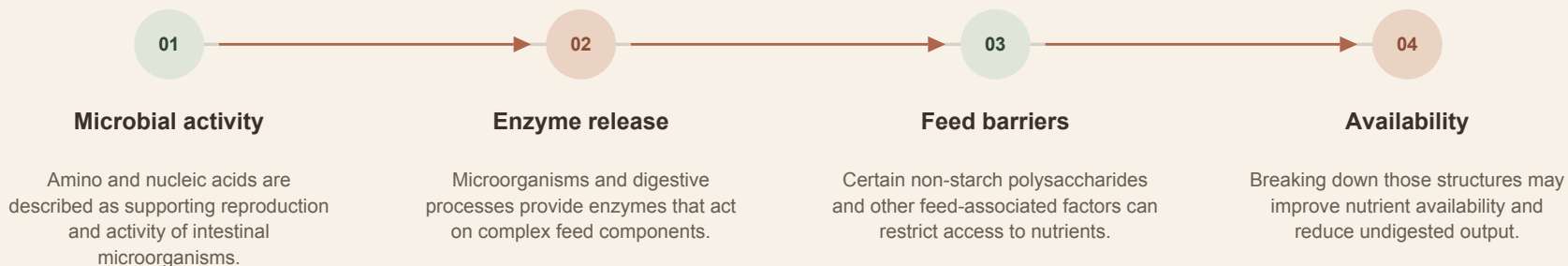




03 NUTRIENT UTILIZATION

Feed-utilization pathway

The nutrient-utilization sequence begins in the intestinal environment and ends with greater access to nutrients in the feed.

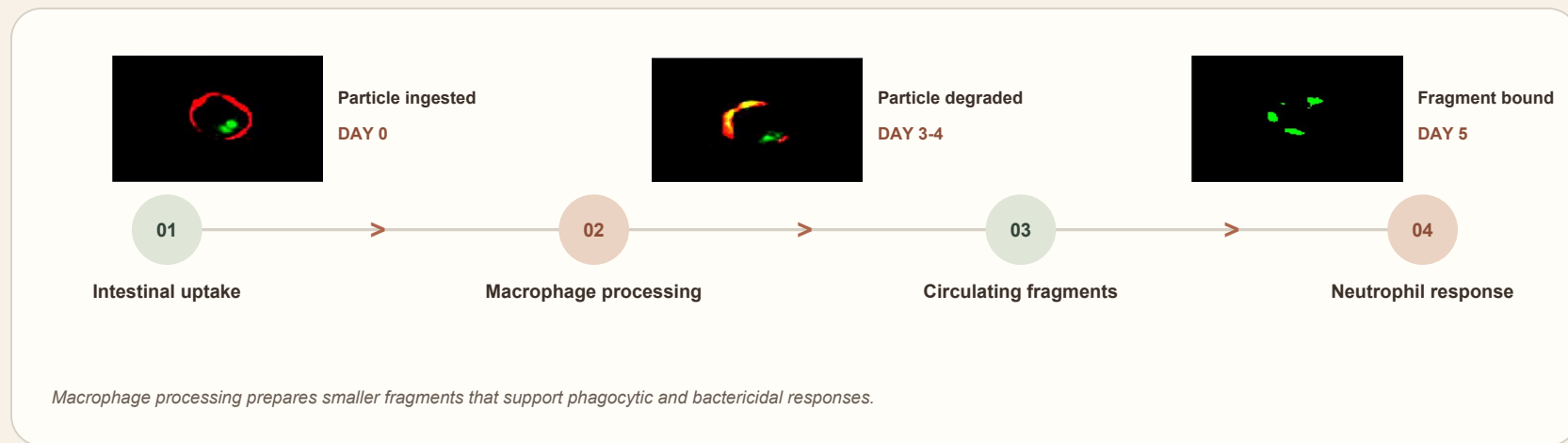


Key program variables: species, life stage, ration composition and inclusion level.

04 MECHANISM

Beta-glucan response pathway

Particulate beta-1,3/1,6-glucan is shown interacting with innate immune cells through uptake, processing and cell activation.





05 RESEARCH EVIDENCE

Poultry immune-response evidence

The two studies answer different questions: the first measures macrophage recruitment, while the second tests function during a Salmonella challenge.

2004

MACROPHAGE CHEMOTAXIS

Broiler immune-response study

160 day-old broilers received 0%, 0.012%, 0.025% or 0.05% beta-glucan for six weeks. The 0.025% and 0.05% groups showed enhanced macrophage chemotaxis. Weight gain and feed efficiency did not differ significantly.

Cheng et al., 2004. DOI 10.5713/ajas.2004.1145

2008

SALMONELLA CHALLENGE

Phagocytosis and bacterial killing

In challenged chicks, 0.1% beta-1,3/1,6-glucan increased macrophage phagocytic and bactericidal activity. Viable Salmonella Enteritidis was eliminated from spleen and liver in the treated trials. Fourteen days was sufficient.

Chen et al., 2008. DOI 10.3382/ps.2008-00147

RESEARCH SUMMARY

The 2004 study measured macrophage chemotaxis. The 2008 challenge study measured phagocytic and bactericidal activity.



06 AQUACULTURE OBSERVATION

Aquaculture observations

The technical record separates a grass carp pond observation from a shrimp tank observation.

GRASS CARP | 3-MU POND (ABOUT 0.5 ACRE)

Pond combination observation

- 01 Visible disease signs and reduced feeding
- 02 150 cc product + three oxytetracycline units
- 03 Repeated once after three days
- 04 No fish died; final result was not followed

SHRIMP | APPROXIMATELY 200 L TANK

White-spot observation

- 01 Six affected shrimp in a 30 x 150 x 50 cm tank
- 02 3 cc product + half an oxytetracycline unit
- 03 Repeated once after three days
- 04 White spots reportedly disappeared

OBSERVATION CONDITIONS

Both records used the product together with oxytetracycline and did not include an untreated control.



07 APPLICATION GUIDANCE

Application ranges and timing

The Chinese technical guide provides separate inclusion ranges for large livestock and for poultry or aquaculture.

LARGE LIVESTOCK

0.15% - 0.2%

1.5 - 2 g per kg of feed

POULTRY + AQUACULTURE

0.1% - 0.15%

1 - 1.5 g per kg of feed

TIMING AROUND HIGH-DEMAND STAGES

Breeding animals

Begin three weeks before parturition and continue through the weaning period.

Young stock after weaning

Continue for approximately one month to 40 days, adjusted to condition and intake.

Mix uniformly. For aquaculture feed, maintain adhesion to the feed and use prepared feed promptly to limit loss into water.

08 TECHNICAL COMPARISON TABLE

Effects on meat-quality measures

Comparative feed study of porcine longissimus dorsi muscle. Letter suffixes show the reported statistical groupings.

Measure	Test group (Lactobacillus)	Comparison group	Yeast extract after 75-105 kg
pH 45 min	6.49 +/- 0.22	6.36 +/- 0.31	6.58 +/- 0.19
pH 24 h	6.08 +/- 0.02	6.01 +/- 0.03	6.02 +/- 0.08
Marbling score	1.40 +/- 0.55 b	1.40 +/- 0.55 b	3.00 +/- 0.82 a
Meat color score	3.40 +/- 0.55 a	2.60 +/- 0.55 b	3.75 +/- 0.50 a
L-value	42.38 +/- 1.89 a	47.10 +/- 2.56 b	40.38 +/- 1.02 a
a-value	6.70 +/- 1.45	6.34 +/- 1.15	6.83 +/- 0.96
b-value	13.34 +/- 0.87	13.88 +/- 2.30	13.65 +/- 1.14
Shear force (kg)	7.49 +/- 0.77 a	8.05 +/- 0.77 a	5.12 +/- 1.30 b
Drip loss (%)	3.16 +/- 0.80	3.49 +/- 0.66	2.62 +/- 0.76
Water content (%)	72.50 +/- 0.27	72.75 +/- 0.82	72.53 +/- 1.15
Intramuscular fat (%)	2.39 +/- 0.38 ab	1.88 +/- 0.29 b	2.70 +/- 0.61 a

REPORTED RESULT

The yeast-extract group was reported with greater marbling, lower shear force and higher intramuscular fat.

Meat-quality comparison



09 HANDLING

Storage and handling reminders

Product quality depends on storage, preparation and accurate inclusion in the complete feed.

01

Use promptly

Prepared fodder should be consumed as quickly as practical.

02

Protect the product

Store indoors in a well-ventilated area and protect from direct sunlight.

03

Mix and dose accurately

Use a measured inclusion and distribute the additive evenly through the ration.

CORE PRINCIPLE

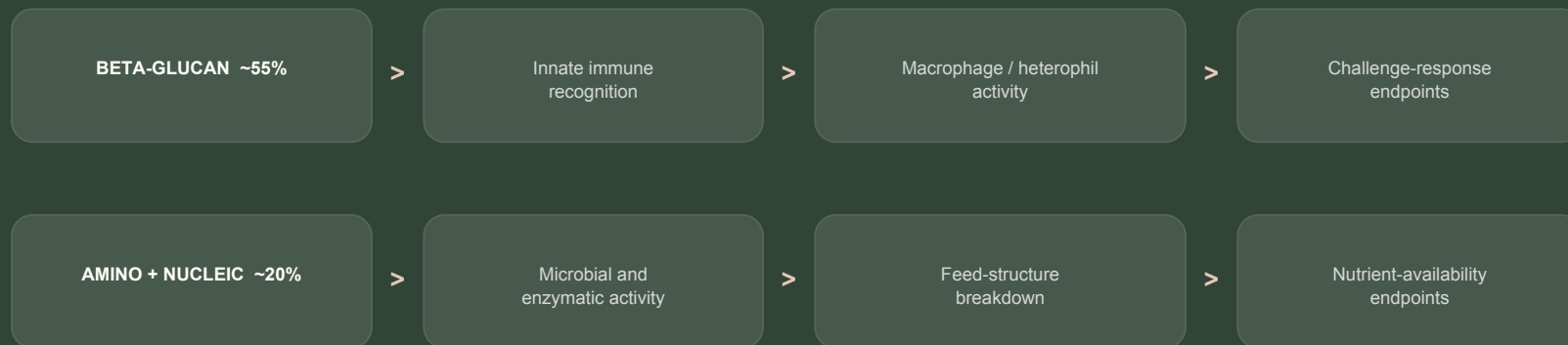
Keep dry, protected and correctly dosed.



10 CONCLUSION

Technical conclusion

Animals BioSystem combines two functional pathways: innate immune response and nutrient utilization.



TECHNICAL SUMMARY

The formulation presents two pathways: beta-glucan immune recognition and amino-acid / nucleotide support for microbial and enzymatic activity.



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ANIMALS BIOSYSTEM | TECHNICAL OVERVIEW

END OF TECHNICAL OVERVIEW

Thank you for your time.

For the current specification, study details or an application discussion, contact the Periodical Systems technical team.

TECHNICAL FOLLOW-UP

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Technical documents and research references are available on request.

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