Rovabio® IN A NUTSHELL *Advance*

The powder form is for mashed and pelleted feeds when heat treatment does not exceed 85°C. Above this temperature, to avoid loss of activity, it is best to spray the liquid form after thermal treatment or use the T-Flex thermostable coated form.

Rovabio® Advance T-Flex is a reliable, high-performance product developed to guarantee the full benefits of Rovabio® Advance for pelleted feed under more demanding conditions.

LIQUID INSTALLATION SUPPORT

Adisseo can help you design and install liquid incorporation equipment to use Rovabio® Advance.

FORMULATION SUPPORT

Adisseo's technical team is at your disposal to discuss the best way of extracting the maximum value out of Rovabio® Advance in each specific condition.

Do not hesitate to contact Adisseo's sales and technical network for expert assistance.

ROVABIO® ADVANCE IS AVAILABLE IN THREE FORMS: Liquid, Powder & Granulated

Product Name	Rovabio® Advance P	Rovabio® Advance P 25	Rovabio® Advance T Flex	Rovabio® Advance T Flex 25	Rovabio® Advance L2	Rovabio®Max Advance P	Rovabio®Max Advance P 25	Rovabio®Max Advance L
Composition	A unique combination of naturally compatible fibrolytic enzymes working synergistically on complex feed substrates							
Micro-organism	*Talaromyces versatilis*							
	Guarented Activities							
Endo-1,4-β-xylanase	25,000 visco units/g (equivalent to 2,600 DNS units/g)	6,250 visco units/g (equivalent to 650 DNS units/g)	25,000 visco units/g (equivalent to 2,600 DNS units/g)	6,250 visco units/g (equivalent to 650 DNS units/g)	12.500 visco units/ml (equivalent to 650 DNS units/ml)	25,000 visco units/g (equivalent to 2,600 DNS units/g)	6,250 visco units/g (equivalent to 650 DNS units/g)	6,250 visco units/ml (equivalent to 650 DNS units/ml)
Endo-1,3(4)-β-glucanase	17,200 VU/g	4,300 VU/g	17,200 VU/g	4,300 VU/g	8.600 VU/ml	17,200 VU/g	4,300 VU/g	4,300 VU/ml
6-phytase	-	-	-	-	-	10,000 FTU/g	2,500 FTU/g	2,500 FTU/ml
Form	Powder	Powder	Granulated	Granulated	Liquid	Powder	Powder	Liquid
Inclusion Rate	50 g/ton of feed	200 g/ton of feed	50 g/ton of feed	200 g/ton of feed	100 ml/ton of feed	50 g/ton of feed	200 g/ton of feed	200 ml/ton of feed
Recommendations for Use	Mash or pelleted feeds up to 85°C	Mash or pelleted feeds up to 85°C	Pelleted feeds up to 90°C	Pelleted feeds up to 90°C	Post pelleting	Mash feeds	Mash feeds	Post pelleting
Shelf life	12 months*	12 months*	18 months*	18 months*	18 months**	12 months*	12 months*	12 months**
Packaging	25 kg carton (500 kg/pallet)	25 kg bag (1,000 kg/pallet)	25 kg carton (500 kg/pallet)	25 kg bag (1,000 kg/pallet)	200 liter drum (800 liter pallet) 1,000 liter IBC	25 kg carton (500 kg/pallet)	25 kg bag (1,000 kg/pallet)	200 liter drum (800 liter pallet) 1,000 liter IBC

* from manufacturing date, in its original sealed packaging stored in dry place below 30°C and protected from high humidity
** from manufacturing date, in its original sealed container, and stored below 20°C, at RTP (max 30°C): 6 months after removal from cold storage (max 12 months from manufacturing date)

EUROPE - AFRICA – MIDDLE EAST
ADISSEO France S.A.S
Immeuble Antony Parc 2
10, Place du Général de Gaulle
92160 Antony | FRANCE

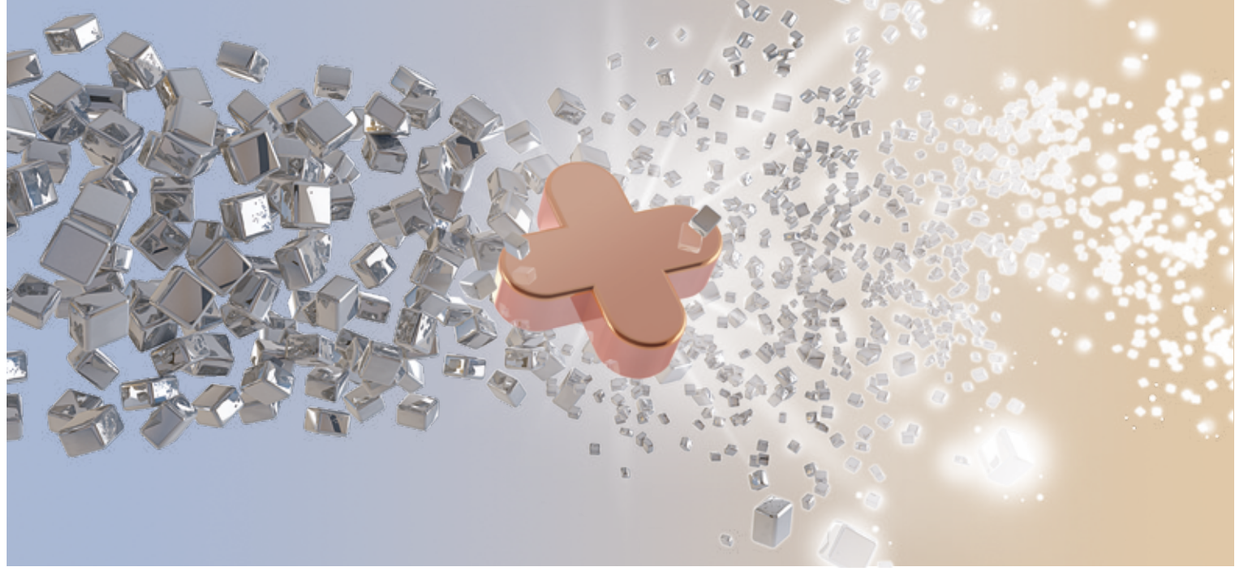
NORTH & CENTRAL AMERICA
ADISSEO USA Inc.
One Point Royal Suite 275
4400 North point Parkway
30022 ALPHARETTA, GA | USA

SOUTH AMERICA
ADISSEO Brasil Nutrição Animal Ltda.
Avenida Maria Coelho Aguiar, 215
Bloco G - 1° andar
São Paulo -SP | BRAZIL

ASIA PACIFIC
ADISSEO Asia Pacific Pte Ltd
30 Hill Street, #03-03
179360 Singapore | SINGAPORE

CHINA
ADISSEO Life Science
Suite 1003-1006, Kerry Parkside
1155 Fangdian Rd., Pudong New Area
Shanghai 201204 | CHINA (PRC)

Rovabio® *Advance*



ROVABIO® ADVANCE: THE REVOLUTION IN FEED DIGESTIBILITY

PROFITABILITY

Rovabio® Advance improves the overall feed digestibility, delivering an optimal feed efficiency for better animal performance and unmatched feed cost savings.

RELIABILITY

Rovabio® Advance shows consistent efficacy across a broad range of raw materials used in feed, offering unrivalled flexibility in feed formulation.

SUSTAINABILITY

Rovabio® Advance contributes to a reduction in the amount of excreta and lower amount of ingredients, providing a positive environmental impact for the industry.

ROVABIO® ADVANCE TO IMPROVE THE OVERALL DIGESTIBILITY OF FEED AND INCREASE THE PROFITABILITY OF SWINE PRODUCTION

ROVABIO® ADVANCE, THE ONLY FEEDASE

- Rovabio® Advance is an innovative enzyme complex produced by *Talaromyces versatilis* fungus, and enriched in arabinofuranosidases.
- It allows improving the overall feed digestibility by 2% in swine, including energy and digestible amino acids

Xylanases	Endo-1,4-β-xylanase β-xylosidase
β-glucanases	Endo-1,3(4)- β-glucanase Laminarinase
Debranching enzymes	α-arabinofuranosidase α-glucuronidase Ferulic acid esterase
Cellulases	Endo-1,4-β-glucanase Cellobiohydrolase β-glucosidase
Pectinases	Polygalacturonase Pectin esterase Endo-1,5-α-arabinanase α–galactosidase Rhamnogalacturonase
Proteases	Aspartic protease Metallo protease
Others	Endo-1,4-β-mannanase β-mannosidase

PIGLETS

Better digestibility and gut health translate into improved performance

- **Higher feed intake:** +1.4% (1)
- **Higher body weight gain:** +5.1%(1)
- **Better feed conversion:** -2.8%(1)
- **Lower diarrhea incidence:** -17.7%(2)

(1) Trial conducted in France.
(2) Trial conducted in France.

SOWS

Better digestibility and gut health result in better performance of sows and progeny

- **Higher feed intake during lactation:** +9% (4)
- **Reduced back fat loss during lactation:** -5.1% (5)
- **Reduced body weight loss during lactation:** -2.5% (5)
- **Higher piglet weight at birth:** +6.3% (5)
- **Higher piglet weight at weaning:** +5.3% (5)

(4) Trial conducted in France.

(5) Trial conducted in Brazil, with supplementation from 2/3 of gestation to 21st day of lactation.

GROWING PIGS

Better digestibility and gut health optimize performance and/or reduce feed costs

- **More energy and amino acids available**
- **Higher body weight gain:** +5.5% (3)
- **Better feed conversion:** -4.6% (3)
- **Shorter time to market:** 2-3 days (3)
- **Decreased feed cost**

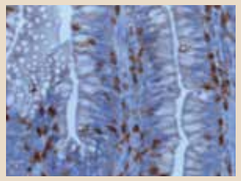
(3) Trial conducted in the Netherlands.

The results reported in this document are extracted from trials and should be considered as examples demonstrating the effect of Rovabio®.

ROVABIO® ADVANCE CONTRIBUTES TO AN OPTIMAL GUT HEALTH

1/ ACTION ON THE PIG DIGESTIVE TRACT

- Lower gut inflammation



In this microscopic picture of ileum, self-defense T-cells are colored in brown. The higher the brown area, the higher the inflammation.

Rovabio® reduces the inflammation by 20%

- Lower energy and amino acid used to maintain gut health
- More energy and nutrients available for growth
- Increased intestinal absorption surface
- Increased nutrient absorption
- Better gut barrier
- Lower incidences of diarrhea

2/ ACTION ON THE GUT MICROBIOTA

- Lower undigested feed
- Favorable microbial balance
- Lower susceptibility to digestive disorders
- Lower incidences of diarrhea, medication, mortality
- Prebiotic-like effect of AXOS
- Increased production of short chain fatty acids (SCFA), especially butyric acid.

In a recent trial, Rovabio® increased the quantity of butyric acid by 180%.(6)

- Increased energy available for growth

(6) Trial conducted inFrance-Belgium

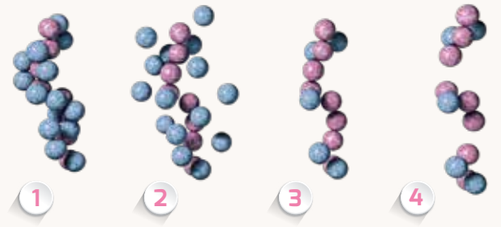
A UNIQUE MODE OF ACTION: THE FEEDASE EFFECT

DIETARY FIBERS AND THEIR DIGESTIVE CONSEQUENCES

Non Starch Polysaccharides (NSP) are the main constituent of plant cell walls and represent the major part of the dietary indigestible fraction.They enclose nutrients that are consequently not available to pigs.

ARABINOFURANOSIDASES, THE KEY TO IMPROVE FEED DIGESTIBILITY

Arabinoxylan is a major antinutritional factor present in cereals. It is composed of a xylose backbone carrying arabinose branches. Arabinofuranosidase, also known as debranching enzyme, cleaves arabinose branches from the xylose backbone, creating new sites for xylanase to efficiently degrade the arabinoxylan.



Arabinoxylan is a highly substituted polymer (1). The arabinofuranosidases remove the branches (2), creating new sites for the xylanases to bind (3) and degrade the main chain with greater efficiency (4).