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#### www.animal-nutrition.basf.com

**D** • BASF We create chemistry

The way to better animal nutrition may be shorter than you think

#### What we stand for

- Sustainable and efficient animal nutrition
- Sound scientific evidence
- Leadership in technology and quality
- Trustworthy partnership
- Pioneering and innovating feed enzymes
- Using digitalization to improve product management, formulation and application

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# **Products & Solutions Animal Nutrition**

As demand for more sustainably produced animal protein grows, so does the performance of our comprehensive portfolio of efficient, sustainable, high-quality ingredients and digital applications for more efficient and sustainable production.

- Carotenoids
- Conjugated Linoleic Acid
- Enzymes
- Glycinates
- Monoglycerides
- Mycotoxin Binders
- Organic Acids
- Vitamins
- Digital Solutions:
  - Opteinics
  - NIR spectroscopy
  - Cloudfarms

### The science of sustainable feed that succeeds

animalnutrition-global@basf.com animal-nutrition.basf.com





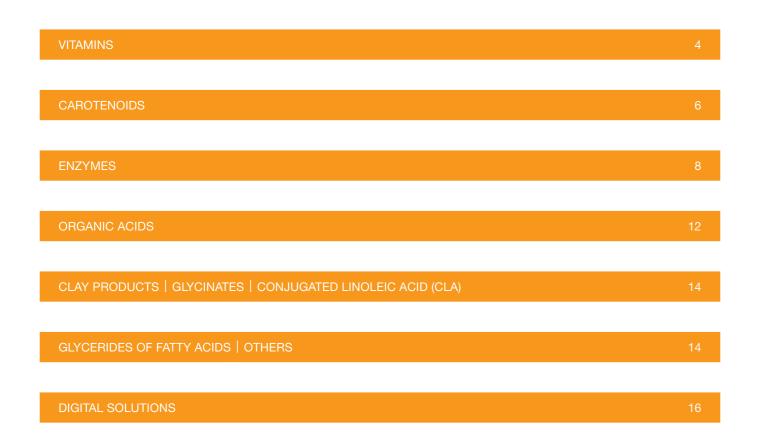
2023

February





### CONTENT



### ABBREVIATIONS

CWD	=	Cold-water-dispersible
FTU	=	Phytase unit
G	=	Granulate
I.U.	=	International unit
L	=	Liquid
TGU	=	Thermostable endo-glucanase unit
TS	=	Thermostable
TXU	=	Thermostable endo-xylanase unit



### FROM FEED TO FARM TO FORK TO THE FUTURE

#### The right products for the right animals, for you and your customers

Above all, our comprehensive range of products, services and solutions delivers. For assured quality, reliability, safety and regulation. Backed by high standards of control and testing. Shown to work in lab and field. For the health and vitality of poultry, pigs, ruminants, fish and companion animals. For greater efficiency and productivity. And as an important contributor to helping secure the supply of healthy, high quality, affordable animal protein to meet increasing consumer expectations.

#### Science-led solutions that are sustainable, proven and effective

For the feed industry, the need for still greater sustainability is a win-win situation. Many of the ingredients we produce already make a substantial contribution. And we are prioritizing sustainable solutions, technologies and production processes throughout our business. Designed to help reduce emissions, make better use of resources, add nutritional value, decrease cost and support the needs of the whole value chain. Innovating to help apply sustainability as a successful business model.

#### We need a still greater focus on the science of sustainable feed

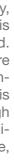
Our long experience of working with the feed industry, supporting feed businesses, farmers and farming is firmly based on practical science, proven in the field. Pioneers of vitamins and enzymes, today we are more than ever intent on finding answers to some of the industry's most complex challenges. We're doing this through our ongoing investment in R&D and through our global research network, working with leading animal nutrition institutes. Aiming to combine science, sustainability and success.

#### Success for your business, our business, people, the planet and the future

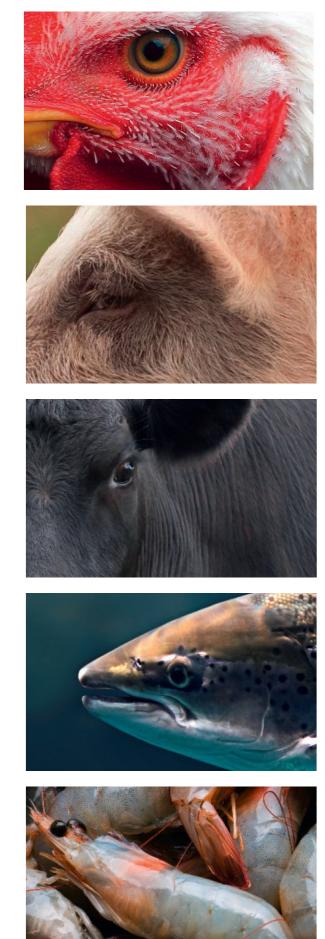
BASF is in business to create chemistry for a sustainable future. In the lab, in production, in the field and between people. And we believe that through solid, grounded science, business sense and co-operation, we can meet challenges, and create and grasp opportunities. So we can all earn a living, deliver for our customers, support the wellbeing of animals and the environment, and provide access to healthy, nutritious food for everyone. We call it the science of sustainable feed that succeeds.











### VITAMINS

PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION	APPLICATION			PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.	
			PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
VITAMIN A										
Lutavit <sup>®</sup> A 500 Plus	Powder	500,000 I.U. of vitamin A per gram		-		¥		30040362 (sold in China only)	25 kg plastic bag	51283583
Lutavit <sup>®</sup> A 500 S NXT	Powder	500,000 I.U. of vitamin A per gram, dispersible in water				¥		30652601	25 kg bag in box	50466277
Lutavit <sup>®</sup> A 1000 NXT	Powder	1 million I.U. of vitamin A per gram		-		¥		30652838	20 kg plastic bag	50750805
Vitamin A-Palmitate 1.7 Mio I.U./g	Oil	1.7 million I.U. of vitamin A per gram (not stabilized)		-		Ý		30600627	25 kg plastic bucket	50368277
Vitamin A-Palmitate 1.7 Mio I.U./g	Oil	1.7 million I.U. of vitamin A per gram				¥		30597685	25 kg plastic bucket	50368587
Vitamin A-Palmitate 1.6 Mio I.U./g	Oil	1.6 million I.U. of vitamin A per gram, for feed use (oral)		-		Ý		30041042	25 kg plastic bucket	55800030
Vitamin A-Propionate 2.5 Mio I.U./g	Oil	2.5 million I.U. of vitamin A per gram, for veterinary use (oral)				Ý		30041062	25 kg plastic bucket	55796320
VITAMIN B										
Lutavit <sup>®</sup> B <sub>2</sub> SG 80	Granulate	80 % riboflavin		-		¥		30215030	25 kg plastic bag	54690103
Lutavit <sup>®</sup> B <sub>2</sub> SG 80 (EU)	Granulate	80 % riboflavin		-	R	¥		30734040 (sold in the EU only)	25 kg plastic bag 500 kg big plastic bag	50643557 54690209
Lutavit <sup>®</sup> Calpan 98 %	Granulate	98 % calcium d-pantothenate		-	R. I	¥		30041184	25 kg plastic bag 500 kg big plastic bag	50011144 50738476
VITAMIN E										
Lutavit <sup>®</sup> E 50 S	Powder	50 % vitamin E acetate, dispersible in water			R-1	¥		30040904	25 kg bag in box 500 kg big plastic bag	50048779 50491064
Lutavit <sup>®</sup> E 50	Powder	50 % vitamin E acetate						30040915	25 kg plastic bag	50075923 50734959
				-	R II	Y			500 kg big plastic bag	50043993 50734957
									950 kg big plastic bag	50599987 57544418
Vitamin E-Acetate Oily Feed	Oil	96 % vitamin E acetate, for feed use (oral)		-		¥		30784532	25 kg plastic bucket 900 kg IBC	50748679 50748680 50748721
	Oil	96 % vitamin E acetate,						30041054	Bulk 25 kg plastic bucket	55434171

1 The contents indicated are minimum amounts of active substance.

Our products are not subject to labelling and traceability according to the European Regulation (EC) 1829/2003 on genetically modified food and feed.

### CAROTENOIDS

			1					,		
PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION					PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.
			PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
ASTAXANTHIN										
Lucantin® Pink CWD	Powder	10% astaxanthin,						30076413	20 kg bag in box	51027961
		dispersible in water							200 kg big bag	51565806
									400 kg big bag	56589728
BETA-CAROTENE										
Lucarotin <sup>®</sup> 10 % Feed NXT	Beadlet	10% ß-carotene		-		¥		30652841	25kg bag in box	50466157
CANTHAXANTHIN										
Lucantin <sup>®</sup> Red 10% NXT	Beadlet	10 % canthaxanthin						30770735	4 x 5 kg bag in box	50515759
									25 kg bag in box	50716686
CITRANAXANTHIN										
Lucantin <sup>®</sup> CX 10% NXT	Beadlet	10 % citranaxanthin				¥		30647233	25 kg bag in box	50580371
C-30 ESTER										
Lucantin <sup>®</sup> Yellow 10% NXT	Beadlet	10 % C-30 ester						30655262	5 kg bag in box	50474628
									4 x 5 kg bag in box	50579486

1 The contents indicated are minimum amounts of active substance.

Our products are not subject to labelling and traceability according to the European Regulation (EC) 1829/2003 on genetically modified food and feed. BSE/TSE status: The above mentioned products either meet the requirements of or do not fall under Regulation (EC) No 999/2001 (current consolidated version), laying down the rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies.

6 CAROTENOIDS

\* Product available outside EU 28 market

Note: National regulations may vary and need to be considered prior to product use.

### **ENZYMES**

PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION	I				PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.
			PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
PHYTASE										
Natuphos <sup>®</sup> E 5000	Powder	Hybrid 6-phytase (5,000 FTU/g), recommended for non-pelleted feed or pelleting up to 85 °C		*		V		30619716	20 kg bag in box 350 kg big bag	50411374 50411378
Natuphos <sup>®</sup> E 10000	Powder	Hybrid 6-phytase (10,000 FTU/g), recommended for non-pelleted feed or pelleting up to 85 °C		*		Ý	-	30648322	20 kg bag in box	50461879
Natuphos <sup>®</sup> E 50000	Powder	Hybrid 6-phytase (50.000 FTU/g), recommended for non-pelleted feed or pelleting up to 85 °C		*		¥		30654521	20 kg bag in box	50471892
Natuphos <sup>®</sup> E 5000 L	Liquid	Hybrid 6-phytase (5,000 FTU/g), recommended for post-pelleting applications		*		٧		30598942	125 kg plastic drum 1000 kg bulk container	50366325 50366324
Natuphos <sup>®</sup> E 10000 L	Liquid	Hybrid 6-phytase (10,000 FTU/g), recommended for post-pelleting applications		*		¥		30598940	1000 kg bulk container	50682917
Natuphos <sup>®</sup> E 5000 G	Granulate	Hybrid 6-phytase (5,000 FTU/g), recommended for non-pelleted feed or pelleting up to 95 °C <sup>2</sup>		*		¥		30635079	20 kg bag in box 350 kg Big Bag	50430020 50607752
Natuphos <sup>®</sup> E 10000 G	Granulate	Hybrid 6-phytase (10,000 FTU/g), recommended for non-pelleted feed or pelleting up to 95 °C <sup>2</sup>		*		¥		30634681	20 kg bag in box 350 kg big plastic bag	50428731 50428732
Natuphos <sup>®</sup> E 17500 G	Granulate	Hydrid 6-phytase (17500 FTU/g), recommended for non-pelleted feed or pelleting up to 95 $^{\circ}\mathrm{C}$ $^{2}$		*		¥	-	30669374	20 kg bag in box 350 kg big bag	50510235 50776890

1 The contents indicated are minimum amounts of active substance.

2 It is recommended to test for phytase retention as pelleting conditions vary greatly.

Our products are not subject to labelling and traceability according to the European Regulation (EC) 1829/2003 on genetically modified food and feed.

STANDARD PACKAGING
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### ENZYMES

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	PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION	I				PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.
				PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
	PHYTASE, XYLANASE, GLUCANASE										
	Natuphos <sup>®</sup> E 5000 Combi L	Liquid	Hybrid 6-phytase (5,000 FTU/g), endo-1,4- beta-xylanase (5,600 TXU/g), and endo-1,4- beta-glucanase (2,500 TGU/g), recommended for post-pelleting applications		*		¥		30631756	125 kg plastic drum 1000 kg bulk container	50425767 50425769
	Natuphos <sup>®</sup> E 5000 Combi G	Granulate	Hybrid 6-phytase (5,000 FTU/g), endo-1,4- beta-xylanase (5,600 TXU/g) and endo-1,4- beta-glucanase (2,500 TGU/g), recommended for non-pelleted feed or pelleting up to 95 °C		*		¥		30654484	20 kg bag in box	50470843
	XYLANASE, GLUCANASE										
	Natugrain <sup>®</sup> Wheat TS	Powder	Endo-1,4-beta-xylanase (5,600 TXU/g), recommended for non-pelleted feed or pelleting up to 85°C		*		¥		30269735	20 kg bag in box	52569309
	Natugrain <sup>®</sup> TS	Powder	Endo-1,4-beta-xylanase (5,600 TXU/g) and endo-1,4-beta-glucanase (2,500 TGU/g), recommended for non-pelleted feed or pelleting up to 85°C		*		¥		30285907	20 kg bag in box 350 kg big plastic bag	53688722 53688775
	Natugrain <sup>®</sup> TS 5XG	Powder	Endo-1,4-beta-xylanase (28,000 TXU) and endo-1,4-glucanase (12,500 TGU/g), recommended for non-pelleted feed or pelleting up to 85 °C		*		¥		30656999	20 kg bag in box	50476892
	Natugrain <sup>®</sup> TS L	Liquid	Endo-1,4-beta-xylanase (5,600 TXU/g) and endo-1,4-beta-glucanase (2,500 TGU/g), recommended for post-pelleting applications		*		¥		30285884	125 kg plastic drum 1000 kg bulk container	50126560 53686496
	Natugrain <sup>®</sup> TS DL	Liquid	Endo-1,4-beta-xylanase (11,200 TXU/g) and endo-1,4-beta-glucanase (5,000 TGU/g), recommended for post-pelleting applications		*		¥		30589044	1000 kg bulk container	50345001
	MANNANASE										
	Natupulse <sup>®</sup> TS <sup>2</sup> NEW	Powder	Endo-1,4-beta-D-mannanase (8,000 TMU/g), recommended for non-pelleted feed or pellet- ing up to 85 °C				¥	*	30712455	20 kg bag in box	50604289
	Natupulse <sup>®</sup> TS L <sup>2</sup> NEW	Liquid	Endo-1,4-beta-D-mannanase (8,000 TMU/g), recommended for post-pelleting applications				¥	*	30716461	125 kg plastic drum	50613046

1 The contents indicated are minimum amounts of active substance.

2 Available only in countries with valid registration.

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### ORGANIC ACIDS

PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION					PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.
			PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
ORGANIC ACIDS										
Amasil <sup>®</sup> 99	Liquid	99 % formic acid		-		٧		30041107	Bulk	50078124
Amasil <sup>®</sup> 85	Liquid	85 % formic acid		-		٧		30041102	1200 kg bulk container Bulk	50034148 50076852
Amasil® 75	Liquid	75 % formic acid		-		¥		30634137	Bulk	50426947
Amasil <sup>®</sup> NA	Liquid	Mixture of formic acid (61%) and sodium formate (20.5%)		-		٧		30286605	1200 kg bulk container Bulk	50246968 53755025
Luprosil®	Liquid	99.5 % propionic acid		-		٧		30041113	950 kg bulk container Bulk	50034360 50078760
Lupro-Grain <sup>®</sup>	Liquid	Mixture of propionic acid (73%) and ammonium propionate (21%)		-		٧		30062123	1000 kg bulk container Bulk	50656908 50020215
Lupro-Grain <sup>®</sup> (NF) NEW	Liquid	Mixture of propionic acid (73 %) and ammonium propionate (21 %)		-		٧		30785686	1000 kg bulk container Bulk	50751564 50751563
Luprosil <sup>®</sup> NC	Liquid	Mixture of propionic acid (12%) and ammonium propionate (51%)		-		¥		30053183	1000 kg bulk container	50094981
Luprosil <sup>®</sup> Salt Calcium	Powder	At least 98 % calcium propionate equivalent to approx. 77 % propionic acid, approx. 21 % calcium		-	R	Ý		30041137 (sold in Asia only)	25 kg bag	50079555
Lupro-Cid <sup>®</sup>	Liquid	Mixture of propionic (25 %) and formic acid (64 %)		-		٧		30041101	1000 kg bulk container Bulk	50034042 50078283
Lupro-Cid <sup>®</sup> NA	Liquid	Mixture of formic acid (39 %), sodium formate (23 %), and propionic acid (18 %)		-		¥		30287386	1200 kg bulk container Bulk	50246969 53843535
Lupro-Mix <sup>®</sup> NA	Liquid	Mixture of propionic acid (35%), sodium propionate (4%), formic acid (20%), and sodium formate (21%)		-		Ý		30473384	1000 kg bulk container Bulk	50381432 50381410

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### MYCOTOXIN BINDERS | GLYCINATES | CONJUGATED LINOLEIC ACID | MONOGLYCERIDES | OTHERS

PRODUCT	FORM	ADDITIONAL INFORMATION <sup>1</sup>	APPLICATION					PRODUCT NO.	STANDARD PACKAGING	ARTICLE NO.
			PETS	AQUACULTURE	RUMINANTS	POULTRY	PIGS			
MYCOTOXIN BINDERS										
Novasil™ Plus (Mycotoxin Binder)	Powder	95 % calcium bentonite			<b>R</b> 1	٧		30571250	25 kg bag 500 kg big bag	50303921 50383639
Novasil™ Plus (Anti-Caking Agent)	Powder	95 % calcium bentonite		-		¥		30571251	25 kg bag 500 kg big bag	50303934 50375255
Novasilect <sup>®</sup> AF	Powder	95 % calcium bentonite		-		¥		30603632	25 kg bag 500 kg big bag	50374934 50413938
GLYCINATES										
Copper-Glycinate	Granulate	Copper mineral content: min. 24 %		-		¥		30591287	25 kg bag 1000 kg big bag	50351985 50566837
Manganese-Glycinate	Granulate	Manganese mineral content: min. 21%		-	R	¥		30591120	25 kg bag 1000 kg big bag	50351989 50566857
Iron-Glycinate	Granulate	Iron mineral content: min. 21 %		-	R	¥		30591119	25 kg bag 1000 kg big bag	50351987 50566851
Zinc-Glycinate	Granulate	Zinc mineral content: min. 26 %			R	¥		30591125	25 kg bag 1000 kg big bag	50349107 50566860
CONJUGATED LINOLEIC ACID (CLA)										
Lutalin®	Oil	28 % omega-6 fatty acid (C18:2) methyl ester					<b>,</b>	30321904	25 kg steel drum 175 kg steel drum 850 kg bulk container	50206899 55423094 50147940
MONOGLYCERIDES										
BalanGut <sup>®</sup> LS P <sup>2</sup>	Powder	43-49% Mono-, di- and triglycerides of butyric acid and medium chain fatty acids				¥		30724567	25 kg paper bag 650 kg big bag	50624860 50624881
BalanGut <sup>®</sup> LS L <sup>2</sup>	Liquid	56-63% Mono-, di- and triglycerides of butyric acid and medium chain fatty acids				¥		30724566	20 kg jerrican 1000 kg IBC	50624857 50624858
BalanGut <sup>®</sup> AQ P <sup>2</sup>	Powder	43-49% Mono-, di- and triglycerides of butyric acid, short and medium chain fatty acids		-				30724719	25 kg paper bag 650 kg big bag	50625849 50625855
BalanGut <sup>®</sup> AQ L <sup>2</sup>	Liquid	52-58% Mono-, di- and triglycerides of butyric acid, short and medium chain fatty acids						30719837	20 kg jerrican 1000 kg IBC	50624702 50624706
OTHERS										
1,2-Propandiol USP	Liquid	99 % 1,2-propandiol			R-1	V		30035115 (sold in Europe, Africa, West Asia only)	1000 kg bulk container Bulk	53403687 50001254

1 The contents indicated are minimum amounts of active substance. 2 ® = Registered trademark of BASF in several countries

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### DIGITAL SOLUTIONS

### **Opteinics**<sup>®</sup> Making feed more sustainable

Sustainably produced food is playing an increasingly important role for consumers. With Opteinics, BASF Animal Nutrition has developed a digital solution to analyze and minimize the environmental impact of animal protein with a focus on animal feed production. The composition of the feed alone can positively influence up to 80% of the total ecological footprint of animal protein such as milk, meat and eggs.

Opteinics<sup>®</sup> stands for Optimizing Protein Analytics and is a digital solution that offers dynamic environmental footprinting of feed and animal protein, which is available as a stand-alone web application or can be integrated into feed formulation software.

Feed and livestock producers, nutritionists and consultants can identify opportunities for sustainability improvements without compromising on cost and nutrition and rely on the solution to assess and improve environmental impacts. With its direct data integration to feed formulation software, time and resources invested are kept to a minimum.



Livestock supply chain's contribution to climate change



LCA tools at

nutritionists' fingertip

#### Feed formulation software



#### New dimensions in ratio design with Opteinics<sup>™</sup>

Opteinics<sup>®</sup> can be integrated into feed formulation software, minimizing environmental impact and add sustainability as a third pillar to feed formulation, along with nutrient levels and feed costs.



Feed & livestock farming in scope

Feed formulation and continuous quality control of The mobile NIR Spectroscopy solution delivers valfeed ingredients or finished feed are time-consumue where it matters most: In the field. Farmers, feed ing and tedious – leaving room for inefficiencies. Tomills, integrators and consultants are now equipped gether with trinamiX, BASF Animal Nutrition offers with a powerful handheld device and app for on the an innovative solution for fast and reliable analysis of spot feed analysis. It is easy-to-use, robust, and reanimal feed and ingredients. sistant to water, dust or dirt.

#### BENEFITS OF MOBILE NEAR INFRARED (NIR) AT A GLANCE

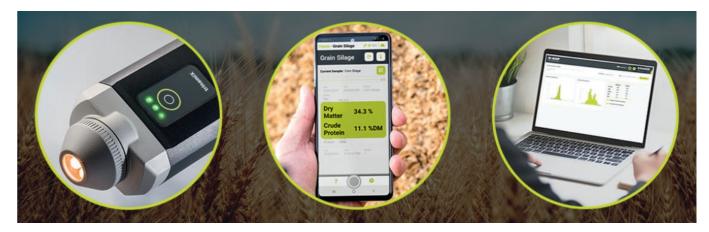
Spectroscopy Solutions trinamiX makes this well-established method affordable and accessible beyond factory and laboratory benchtop equipment. A powerful, cloud-based combination of handheld device, smartphone app and customer portal. Get immediate insights with trinamiX' Mobile NIR Solution, saving you time and money:

#### **Fast results**

Receive valuable insights within seconds to flexibly adapt your feeding routine

#### **Transparent nutrition**

Analysis of a number of important parameters in the feed, e.g.: Moisture, Fat, Protein, NDF, ADF, Energy content



The 'lab for the pocket' allows fast, real-time and reliable on-site analysis.



The mobile NIR solution delivers accurate insights into a broad range of animal feed products, including finished feed, feed ingredients and forages.

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### DIGITAL SOLUTIONS

### trinamix Mobile Near Infrared (NIR) spectroscopy for feed analysis



#### **Reliable measurements**

Patented optical detectors and proprietary chemometrics bring lab reliability into your pocket.



Uust and water resistant, shockproof: Developed for the field and tested for easy use and peace of mind.

	<ul><li>Rumiants</li><li>Swine</li><li>Poultry</li></ul>
2	<ul> <li>Cereals</li> <li>Oilseed &amp; Expeller Meals</li> <li>Extraction Meals</li> <li>Byproducts</li> </ul>
2	<ul> <li>Grain Silage</li> <li>Grass Silage</li> <li>Hay</li> <li>Fresh Grass</li> </ul>

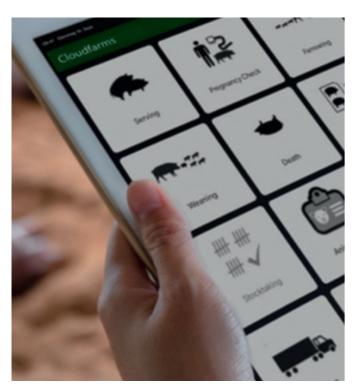


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### **Cloudfarms**

The smartest way to manage pig production

Cloudfarms is the first fully cloud-based swine management system for highly productive and efficient livestock farming. Our easy-to-use mobile app and software was developed to address the requirements of modern swine production. It supports all processes and is suitable for farms of any size. Cloudfarms saves time, prevents mistakes, and helps to make data-driven decisions. The insights gained through digital solutions by analyzing and linking data along the value chain help increase efficiency, animal health and sustainability in swine production.

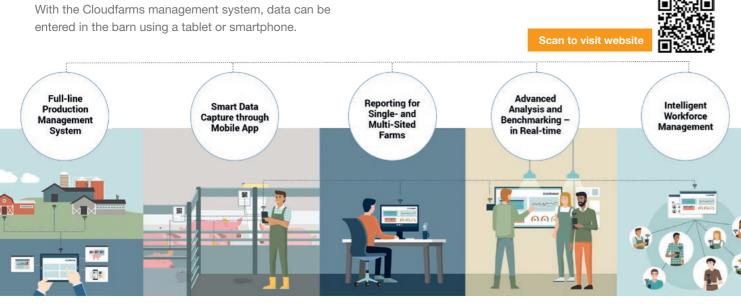


Cloudfarms' farm management system enables producers to manage, track and analyze their production data from daily operations in real-time:

Control:	Production managers oversee the daily production on multiple farms simultaneously, from anywhere.
Efficiency:	Farm workers save time in the barn by up to 10% with our mobile app. Data entry errors are reduced by up to 85%.
Productivity:	Data-capture-to-reporting takes seconds only, enabling managers to make production decisions fast.
IT Administration:	Farms save costs for IT administra- tion, without the need for on-prem- ise servers, software installations or maintenance.
Innovation:	Farms get a partner constantly de- veloping solutions further: for pig production, sustainability, traceabil- ity and Precision Livestock Farming.

#### BENEFITS OF CLOUDFARMS AT A GLANCE

- The Cloudfarms management system is ideally suited for large-scale, multi-sited swine farming.
- It is an open platform with strong integration capabilities to any other system on the farm like feeding systems or ERP solutions.
- Our mission is to develop the most innovative solutions for pork production management, traceability, sustainability, and precision pig farming.





## Natuphos<sup>®</sup> E Natugrain<sup>®</sup> TS Natupulse<sup>®</sup> TS

## Enzymes to fully utilize the potential of your feed

- Increasing nutrient and energy digestibility
- Exceptional process and storage stability
- Broad and flexible application
- Improved resource efficiency

#### The science of sustainable feed that succeeds



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