

# DELFOF



## **DELFOF: THE NATURAL CALCIUM ENRICHED MONOCALCIUMPHOSPHATE**

Delfos is the product name for Sonac's dicalciumphosphate-dihydrate (DCP.2H<sub>2</sub>O). It is produced from animal bones that have been crushed and degreased. This material is left during 5 days in a HCl solution to dissolve the gelatin and bone phosphate. Gelatin is separated and the remaining phosphate is carefully precipitated by addition of calcium hydroxide: here Delfos is created.

**Natural Ingredients. Smart Solutions.**

**sonac**



# HOW TO USE DELFOS

## ADDITIONAL NUTRITIONAL VALUE

The solid phosphate is separated and dried. During the whole process the focus is on achieving the highest bio-availability of calcium and phosphorus in animal nutrition as possible. Delfos is produced at Rousselot factories located in France, USA and China. According to the current EU feed law Delfos is permitted to be used in aqua feeds and in feeds for non-ruminants: i.e. pigs and poultry. Dedicated feed mills or production lines are therefore necessary.

## SUSTAINABLE AGRICULTURE

Mineral phosphates are produced from mined rock phosphates out of reserves that are limited towards the future. Delfos is produced from bones of healthy animals. So using Delfos as a source of phosphorus contributes to the reuse of this resource.

## HIGH AVAILABILITY

Special care is taken during the precipitation process (by slowly adding calcium hydroxide) and during the drying phase (by leaving crystalline water) to ensure the best possible availability of phosphorus for the targeted animals.



## THE ADVANTAGES OF DELFOS:

- a very high level of available and digestible phosphorus and calcium
- one homogeneous product, not a blend of mono- with tri-calcium phosphate
- natural and safe origin
- low in heavy metals, dioxin and radio-activity
- tracking and tracing system in place
- contributes to sustainable livestock production (reuse of P)



## BIO-AVAILABILITY

In animal nutrition a lot of different systems are in use to make the best estimation of the bio-availability of especially phosphorus for farmed animals. This leads to several values for the same phosphorus source in different countries of the world. Sonac recommends the values obtained and deducted from the Dutch CVB system (the pioneers in developing the systems of digestible P for pigs and absorbable P for poultry).

Delfos	Poultry
Digestible P (% of total P)	94,5
Available P (% of total P)	100

These digestibility figures for phosphorus have been concluded from a trial done with poultry at the WUR institute (the Netherlands), following the new WPSA<sup>1,2</sup> protocol.

<sup>1</sup> WPSA (World Poultry Science Association)

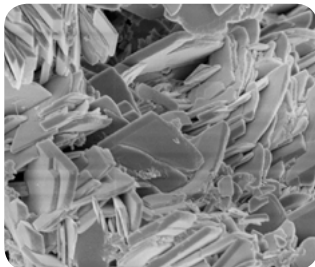
Literature reference:

<sup>2</sup> Rodehutsord, M. 2013. Determination of phosphorus availability in poultry. World's Poult. Sci. J. 69:687-698. doi 10.1017/s0043933913000688.

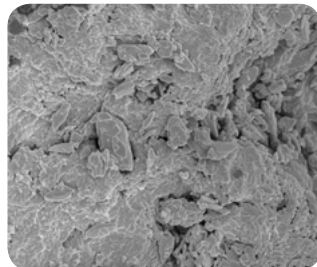


### APPLICATION IN:

- non-ruminant feed
- aqua feed
- pet food
- organic fertilizer



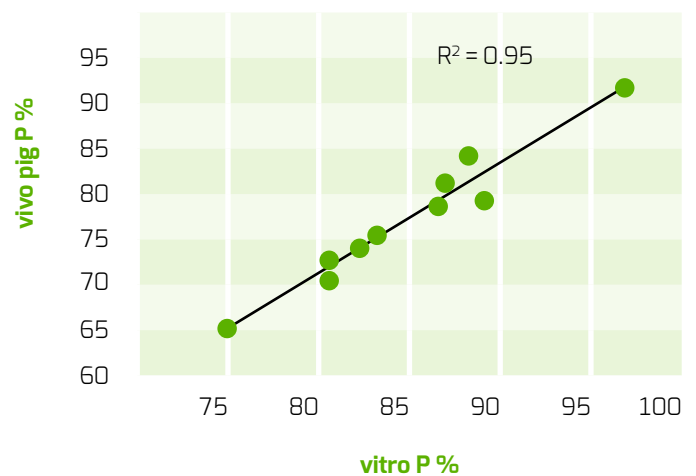
Delfos: very accessible structure which ensures a high digestibility



Rock phosphate: more clotted appearance and therefore less accessible

## IN-VITRO ESTIMATIONS

Apart from testing on living animals (in-vivo) also in-vitro methods have been developed to assess the bio-availability of phosphorus sources. A validated in-vitro method is a method developed by CCL (NL) based on the two enzymes pepsin and pancreatine, which simulates the digestive tract of pigs. More data are available on request.



## HEAVY METALS AND OTHER CONTAMINANTS

Contaminant	Units	Max	Delfos	Processed** Rock Phosphate
Arsenic	mg/kg	10	< 1	5
Cadmium	mg/kg	10	< 1	5
Fluorine	mg/kg	2.000	550	1.004
Lead	mg/kg	15	< 0,2	5
Aluminium	mg/kg	n.a.	< 10	12.000
Dioxin	ngTEQ/kg	0,5	< 0,11	0,17
<b>Radio-activity*</b>				
Cadmium 109	Bq/ unit	n.a.	Negative	1.8* 10 <sup>4</sup>
Radium 226			Negative	1.1* 10 <sup>4</sup>
Americanum 241			Negative	8* 10 <sup>3</sup>

\* Negative means: no increased radiation compared to the background

\*\* Derived from database contaminants DOS

Nutritional data (indicative and as is)	g/kg
Moisture	13
Crude ash	775
Calcium	218
Phosphorus	172
Digestible P poultry	163
Available P poultry	172

Sonac is a leading manufacturer of reliable ingredients of animal origin. With an active R&D program, reliable processes and sustainable end products Sonac continuously adjusts to market needs. A good geographical spread of locations and a broad portfolio of fats, proteins, minerals and specialties make Sonac a trusted partner for many international producers in food, pet food, feed and fertilizers, worldwide. Sonac is part of Darling Ingredients.



SON - prod - Delfos - 0616

**For more information about this specialty product please contact us:**

PO Box 9 NL 5690 AA Son +31 (0)499 364 800 info@sonac.biz

sonac.biz

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