

**DELFOFOS**  
**Powder**  
**From Rousselot Isle-sur-la-Sorgue, France**

**DELFOFOS, DI CALCIUM PHOSPHATE -  
DIHYDRATE :**

DELFOFOS is the product name for Dicalcium Phosphate-dihydrate from bones. Rousselot Isle sur la Sorgue produces DELFOFOS from crushed and degreased bones coming from cattle from animals declared "fit for human consumption". These bones are treated by a solution of hydrochloric acid and the di calcium phosphate is precipitated by addition of calcium hydroxide then dried.

In compliance with the Regulation (EC) No 1069/2009, the facility of :

Rousselot  
Chemin Moulin Premier  
F-84800 Isle-sur-La-Sorgue  
France

Is identified by the Departmental Directorate for Protection of Populations under number :

**FR84054001**

And is approved for the conversion activity for category 3 animal by-products pursuant to article 24 1.a of Regulation (EC) No 1069/2009 intended to be used as animal feed, in accordance with the rules laid down in Regulation (EC) No 999/2001. The operation of this facility involves conversion to Dicalcium Phosphate carried out in accordance with section 6, point B of Commission Regulation (EU) No 142/2011 of 25 February 2011.

Delfos is declared as a "feed material".

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.

Delfos can be used for fertilizer and technical application.  
Delfos doesn't contain additives.

### **Storage conditions**

DCP has to be stored in a wind- and rainproof accommodation. Additionally the storage room must have the possibility to be closed. Further the goods have to be stored in a way that will be prevented. Shelf life of 5 years.

Each delivery (packaging bag or big bag, truck ) is identified by the reference of the batch of production (lot number as a chronologic number or date of production)

Except for the regulatory information under the headline guarantee, the information in this product specification must be read as an indication for the users of DCP. Rousselot has joined the Sonac Delfos datasheet for the application information.

### Guarantee

Dicalcium phosphate from bovine bones	Calcium : 21 % minimum P 17% minimum (as P2O5 39% min) Ca/P > 1,2 Moisture < 3% May contain up to 3 % chloride expressed as NaCl.
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### Analytic

<b>Analysis g/kg</b>		
Moisture	13	
Ash	775	
<b>Minerals g/kg</b>		
Calcium	218	
CaO	305	
Phosphorus	172	
P2O5	394	
Magnesium	0.2	
Potassium	0.3	
Sodium	2.4	
Chlorine	4.5	
<b>Trace elements mg/kg</b>		
Lead	max 10	
Mercury	max 0.1	
Arsenic	max 2	
Cadmium	max 2	
Fluor	<2000	

%



**DELFOFOS: THE NATURAL CALCIUM ENRICHED  
MONOCALCIUMPHOSPHATE**

Delfos is the product name for Sonac's dicalciumphosphate-dihydrate (DCP $\cdot$ 2H $_2$ 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**

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TVA : FR 87 484 870 142



#### 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)

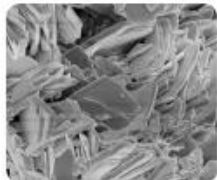
Literature reference:

<sup>2</sup> Rodehutsord, M. 2013. Determination of phosphorus availability in poultry. World's Poultry Sci. 1: 69:667-698. doi 10.1017/S0043933913000568.



**APPLICATION IN:**

- non-ruminant feed
- pet food
- aqua feed
- 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.



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