

TALKING FEED INGREDIENTS



NEWS FROM ALIPHOS



SEPTEMBER 2019

Aliphos at SPACE in Rennes.

Like in the past years Aliphos will be present at the SPACE exhibition in Rennes.

You can find us in hall 9, booth B32



Join us and meet with our sales & marketing team which will update you about the recent developments within Aliphos.

It is also an opportunity to discover our new feed phosphate: Aliphos® Sodiphos, a highly soluble monosodium phosphate (MSP).



Aliphos at SPACE in September 2018

Practical information SPACE:

- From Tuesday 10th till Friday 13th September
- Place: Parc-Expo in Rennes, France
- Aliphos booth: hall 9, B32

Aliphos at Asian-Pacific Aquaculture.

From 19th till 21st June the Asian-Pacific Aquaculture Conference took place in Chennai, India.

Aquaculture, and so aquafeed production, is developing fast in Asia Pacific and certainly also in India.

One of the fastest developing species in aquaculture is shrimp (mainly whiteleg shrimp or *Litopenaeus vannamei*).

During the conference Aliphos had the occasion to present its latest results with Windmill® Aquaphos on performance and retention of phosphorus in shrimp.



Aliphos presentation at APA in Chennai, India

New coated products

Aliphos enlarged its range of coated feed ingredients with some new products:

- **Aliphos® RumiN** (see also Talking Feed Ingredients of the month of June): a slow release coated urea for ruminants to create a constant supply of N in the rumen.
- **Aliphos® RumiS**: a slow release coated sodium sulfate for ruminants. Coating allows the S to be slowly released in the rumen resulting in a synchronized S-supplementation for ruminal micro-organisms.
- **Aliphos® PorcLax**: a coated sodium sulfate for pigs, especially for sows and gilts in order to avoid constipation around farrowing.
- **Sil Butyr 30C**: a coated sodium butyrate for monogastric wellbeing. Butyric acid creates better balance of the microflora population in the intestine. It induces growth of lactic acid and lactobacillus in the intestine. Sil Butyr 30C has a significant impact on Salmonella colonization.

NEW TRIAL RESULTS WITH WINDMILL® AQUAPHOS STUDYING THE EFFECTS OF ELEVATED LEVELS OF FEED PHOSPHATES ON BLOOD PARAMETERS, CORPSE ANALYSIS, INTESTINAL HISTOLOGY AND GROWTH RATE OF KOI

This trial has been carried out in 2018 by the department of Aquatic Animal Health of the University of Tehran, Iran. Goal of this research was to study the effects of elevated phosphate levels in combination with or without Spirulina on blood chemical factors, corpse analysis, intestinal histology and growth rate on koi carp (*Cyprinus carpio*).

Contrary to other trials with other fish and shrimp species, this trial was not developed to retrieve phosphorus digestibility or – retention values of the different feed phosphates, but instead studied the effect on performance and health of elevated levels of phosphorus in the diets. Since aquatic diets are changing in the sense that less fish meal used being replaced by vegetable protein sources there is a higher need for supplemental phosphorus in the form of inorganic feed phosphates. However, there are some doubts among nutritionist and formulators as to high levels of phosphorus because of supposed negative effects on mainly performance. This trial has been developed to exclude this possible negative side effect. However, at the same time this protocol offered also the opportunity to study the phosphorus requirements of carp because of increasing levels of phosphate supplementation. The combination with spirulina was chosen because there are some reports that spirulina can bind phosphorus, rendering it unavailable. Spirulina is used in Koi carp feeds because of its coloring properties.

Trial protocol

At arrival at the research facility the Koi were placed in a tank for an adaptation period for 28 days (first trial day). At day one of the trial fish were selected and triplicate groups of 38 carp with an average weight of 17g, were fed one of the trial diets for 8 weeks. 10 trial diets were formulated to contain increasing inclusion levels of Windmill® Aquaphos (Aquaphos) and one inclusion of Aliphos® Monocal (MCP), with and without Spirulina, including two control feeds (with and without spirulina without addition of feed phosphates). CaCO₃ was used to arrive at a fixed Ca:P ratio of 0.84. Feed phosphates were formulated with an assumed phosphorus digestibility of 80%. Also, at day one, three fish from each tank were randomly selected for determining blood chemical factors and histological analysis of the intestine. Same fish were used for carcass and vertebrae analysis (bone).

	CTRL	0,75% Aquaphos	1,5% Aquaphos	3% Aquaphos	3% MCP
CPSP 90	2,500	2,500	2,500	2,500	2,500
Squid meal	5,000	5,000	5,000	5,000	5,000
Krill meal	2,500	2,500	2,500	2,500	2,500
Green mussel extract	2,500	2,500	2,500	2,500	2,500
Spirulina	(7.500)	(7.500)	(7.500)	(7.500)	(7.500)
Soy protein concentrate	20,000	20,000	20,000	20,000	20,000
Pea protein concentrate	1,000	1,000	1,000	1,000	1,000
Wheat gluten	8,000	8,000	8,000	8,000	8,000
Corn gluten	20,000	20,000	20,000	20,000	20,000
Wheat meal	22,200	21,050	19,890	17,580	19,090
Brewer's yeast	2,500	2,500	2,500	2,500	2,500
Macro algae mix	2,500	2,500	2,500	2,500	2,500
Aquaphos		0,750	1,500	3,000	
MCP					3,000
Calcium carbonate		0,400	0,810	1,620	0,110
Salmon oil - Sopropheche	5,500	5,500	5,500	5,500	5,500
Vit & Min Premix (no P)	2,000	2,000	2,000	2,000	2,000
Antioxidant & acidifier	0,500	0,500	0,500	0,500	0,500
Other incl. pigments	2,050	2,050	2,050	2,050	2,050
Vitamins & amino acids	1,650	1,650	1,650	1,650	1,650
	100,000	100,000	100,000	100,000	100,000
Total P, % feed	0,434	0,626	0,817	1,200	1,106
Phytate-P, % feed	0,154	0,153	0,152	0,149	0,151
Estimated dP, % feed	0,242	0,396	0,550	0,858	0,782
Ca, % feed	0,366	0,525	0,689	1,011	0,933
Ca/P	0,84	0,84	0,84	0,84	0,84

Table 1: Feed composition

Carp were fed 2 times daily at a feeding rate of 2% of the body weight. Stagnant water tanks of 220 l were used to enable to study the effects of the different feed phosphates on water quality. At day 63 carp were sampled for determining blood chemical factors, histological, carcass and vertebrae analysis.

Results

Increasing phosphorus inclusion levels showed increasing growth (figure 1). Growth (g) ranged from 17g, for the control diet, up to 27g for the diet including 3% Aquaphos. MCP at 3% inclusion showed a lower growth than in case Aquaphos at 3%. Results in growth between the Aquaphos 0.75 and 1.5% and MCP 3% were not significant different indicating a lower P-availability of MCP.

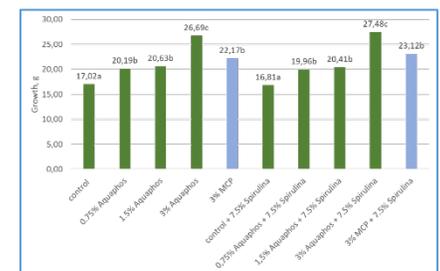


Figure 1: Growth of Koi carp after 8 weeks.

Increasing levels of Aquaphos showed an increase in phosphorus blood content, contrary to the 3% MCP inclusion, which showed values not different from the control and 0.75% Aquaphos (figure 2).

Other blood parameters showed no significant differences over the groups. However, highest alkaline phosphatase levels were observed in the two control groups, without addition of any feed phosphate (figure 3).

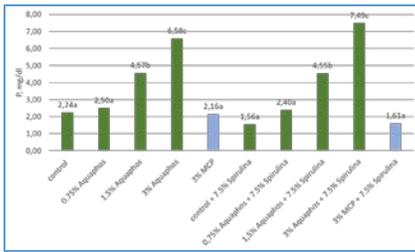


Figure 2: Increase of blood phosphorus content.

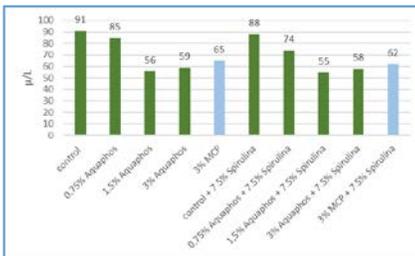


Figure 3: Blood Alkaline Phosphatase levels end of trial.

As to the increase in bone phosphorus content, there were significant differences between the different diets (figure 4). The negative control showed hardly any increase in bone phosphorus content whereas carp receiving diets including Aquaphos at 3% showed the highest increase. Surprisingly, carps fed the diets including 3% MCP could not even reach the same levels as Aquaphos at lower inclusions (0.75% and 1.5%). Also, there is small effect of Spirulina on bone phosphorus content. Overall carps fed with diets supplemented with Spirulina showed a lower increase of bone phosphorus content. An indication that indeed Spirulina can bind some phosphorus rendering this unavailable for fish.

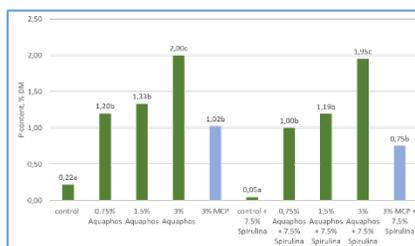
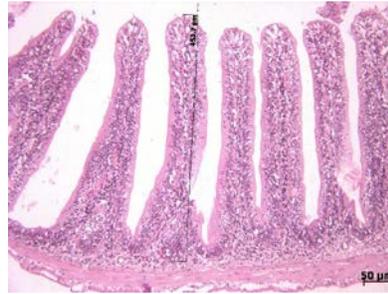


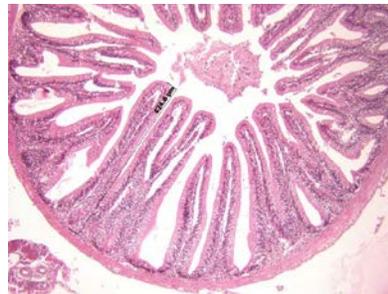
Figure 4: Increase on bone phosphorus content.

Histological analysis of the intestine showed that the intestinal villi were

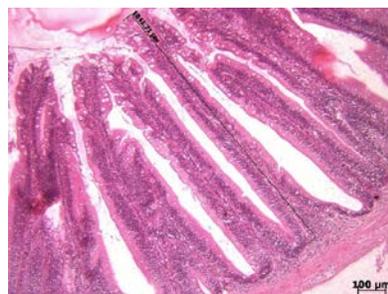
better developed with the diet(s) including 3% Aquaphos. According to the researches villi growth followed growth rate of the fish (picture 1 - 3).



Picture 1: Interior part of intestine (µm) Group 4 (3% Aquaphos).



Picture 2: Middle part of intestine (µm) Group 4 (3% Aquaphos).



Picture 3: Posterior part of intestine (µm) Group 4 (3% Aquaphos).

Between the different groups there were no differences in ammonia content of the water, confirming that the inclusion of Aquaphos had no negative effect on the possible increase of ammonia in the water. Lowest phosphorus levels in the water were seen with the control groups. Highest P-level was observed with the diet containing MCP at 3% inclusion with spirulina which might indicate a lower phosphorus retention with this diet.

Conclusions.

From this study we have learnt that Aquaphos is a very efficient and safe phosphorus source also in case of carps. Growth at 3% inclusion of Aquaphos was significantly higher than for the other groups, including MCP at 3% inclusion rate. The same was reflected in a significant higher blood phosphorus content and higher bone phosphorus content. Use of Aquaphos even at higher levels did not negatively affect water quality parameters, contrary to the inclusion of 3% MCP in combination with Spirulina which resulted in a higher phosphorus content of the water. These trial results suggest that Windmill® Aquaphos has a significantly higher phosphorus-bioavailability than in case of monocalcium phosphate for carp. Also, from this trial it can be hypothesized that the requirement for carp for digestible phosphorus is about 0.9 %.



Figure 4: koi carp



Figure 5: trial facilities of the department of Aquatic Animal Health of the University of Tehran

ALIPHOS MEETING ITS CUSTOMERS

Also in the coming months Aliphos will be present at several events to meet customers and to present results of trials with our products. Besides the SPACE, you can find us at:

- **EAS conference** in Berlin from 7th till 10th October:



Aliphos will present during this event the trial results on koi carp as described in the article above. During the conference our sales & marketing team will be available to discuss with you the trial results with our feed phosphates and to give you more information about Windmill® Aquaphos and its advantages in aquafeed.



- **SIPSA** in Alger from 7th till 10th October:



Together with our partner Diam Grain, Aliphos will assist at the most important exhibition for animal husbandry in Algeria.



- **AGRENA** in Cairo, Egypt from 17th till 19th October:



You are very welcome to visit our booth. You can find us in Hall 2.



- **LAQUA** in San José, Costa Rica from 20th till 22nd November:



Aliphos will also be present at this event. We will show our latest research findings on phosphorus in shrimp feeds. Again these results show that Windmill® Aquaphos is a superior phosphorus source for use in aquaculture, not only with fish but also with shrimp. We would be happy to meet you in San Jose.



MORE INFORMATION ON ALIPHOS AND ECOPHOS CAN BE FOUND ON WWW.ALIPHOS.COM AND WWW.ECOPHOS.COM



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