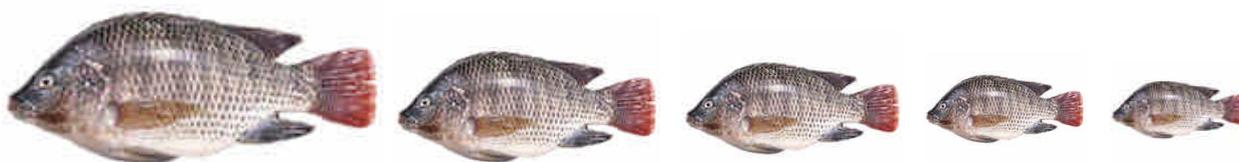


BOOSTING FISH GROWTH

More results on the use of diformates in tilapia diets

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The use of acidifiers in aquaculture is currently gaining more interest among researchers as well as practitioners. A wide range of different organic acids and salts have been tested so far (Lückstädt, 2008). Especially diformates have been used very regularly in tropical, as well as cold-water aquaculture, because of its high load of active ingredients on the one hand as well as its stability and handling properties in extruded feeds on the other hand.

Ramli *et al.* (2005) tested potassium diformate as a growth promoter in tilapia grow-out in Indonesia (as reported in the [autumn issue of AQUAFEED: Advances in Processing & Formulation](#)). Similar results were achieved by Zhou *et al.* (2008) in a dose response study with potassium diformate (0%, 0.3%, 0.6%, 0.9% and 1.2%), while Ng *et al.* (2009) tested the substance in a 14-week feeding trial in tilapia as well. All researchers reported a positive impact against pathogenic bacteria, lower mortality rates as well as improved performance of the fish.

Recently, research groups in the Philippines as well as in Germany have concentrated their work again on the use of diformates in tilapia. Researchers from the Southeast Asian Fisheries Development Center - Aquaculture Department in Binangonan, Philippines looked at the effect of potassium diformate (KDF).

Twenty-five male Nile tilapias with a mean weight of 7.84 ± 0.90 g were stocked in eight 240 l polyethylene tanks in a static-renewal system. Fish were reared for 74 days. Proximate composition of the commercial feed was 31.4% crude protein, 6.9% crude fat, 8.6% crude fibre, 52.3% NFE and 0.8% ash as well as a gross energy of 17.3 kJ g^{-1} . The fish in both the control and KDF treatment were given the appropriate feed with a daily ration equivalent to 5% of their body weight. Feed was dispensed thrice a day at 0800h, 1200h and 1600h. Water parameter as well as growth performance of fish were monitored regularly.

Diet supplemented with KDF yielded improved growth data, based on daily growth rate as well as specific growth rate ($P < 0.01$). Tilapia in the control group reached a mean body weight of 45.5 ± 1.1 g, while the fish fed with potassium diformate reached an average weight of 51.4 ± 2.2 g. Likewise, feed conversion ratio was improved significantly ($P < 0.05$).



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The results show that addition of 0.3% KDF in the diets of Nile tilapia can help to improve its growth performance and thus, can achieve a more economic and sustainable tilapia production. Furthermore, the additive optimizes feed efficiency, which is in full agreement with previously reported improved digestibility parameters after the inclusion of KDF in fish feeds.

On the other hand, researchers from the Göttingen University in Germany concentrated their work on the most recently developed double salt feed additive - sodium diformate, which is also produced at ADDCON's production site in Norway.

Preliminary data from a semi-closed re-circulating system showed promising results on the use of sodium diformate at 0.3% inclusion rate in tilapia fingerling rearing (see table 1).

Table 1: Growth performance of tilapia after 42 days fed with or without sodium diformate

	Control	Sodium diformate (0.3%)	P-level
Number of fish	160	160	-
Initial weight (g)	34.0	33.9	n.d.*
Final weight (g)	70.9	75.5	n.d.
Weight gain (g)	36.9	41.6	0.098
FCR	1.46	1.29	0.007

*n.d. - not determined

Latest results from Auburn University, USA are in full agreement with the above mentioned trials.

Those three data sets from the Philippines, Germany as well as the United States will be presented in full during the 14th International Symposium on Fish Nutrition & Feeding in Qingdao, China at the end of May.

In general the authors concluded that data achieved under high hygienic conditions at laboratory scale will lead to even more pronounced effects of diformates in the field. It is therefore highly recommended to include organic acid salts, like diformates, in the ration of growing fish under tropical conditions.



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