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Effects of diformates on growth and feed utilization of all male Nile Tilapia fingerlings (*Oreochromis niloticus*) reared in tank culture**F.Liebert¹, K. Mohamed² and C.Lückstädt³**¹ Dept. of Animal Sciences, Division Animal Nutrition Physiology, Georg-August-University Goettingen, Kellnerweg 6, 37077 Goettingen, Germany² Dept. of Animal and Fish Production, Faculty of Agriculture, Suez Canal University, 41522 Ismailia, Egypt³ ADDCON EUROPE GmbH, 53113 Bonn, Germany**Abstract**

Similar to land animals, at present feeding strategies in aquaculture tend to increase application of feed additives which were successfully applied in other animal species and generally accepted from the viewpoint of feed and food safety. Global production of farmed Tilapia in at least 85 countries exceeded 2.5 million t in 2007 and requires high-quality fish feeds. Generally, diformates are able to stabilize feed quality by conservation effects, but only a few observations are available due to zootechnical effects of these feed additives when applied in Tilapia diets. The current investigation aimed to examine effects of potassium diformate (0.3% KDF) and sodium diformate (0.3% NaDF; 0.5% NaDF), when added separately to a basal diet (Soybean meal 30%; corn 25%; wheat gluten 15%; wheat 14%; fish meal 5%; L-Lys·HCl 0.18%; DL-Met 0.3%; premixes and wheat starch ad. 100%) without any further non-nutrient feed additive. Totally 32 fibreglass tanks (380 l/tank) of a semi-closed re-circulating system were utilized, each stocked randomly with 20 Tilapia fingerlings (Initial BW = 33.9±0.06g). During the whole experiment, no mortality was recorded. After finishing the growth study (56d), pooled samples of average fish were analyzed for whole body composition to evaluate the effects on deposition and utilization of protein. The results of the growth study demonstrated, that diets supplemented with KDF or NaDF yielded improved growth data, but statistical significance was not observed ($p>0.05$). In addition, feed efficiency was enhanced in the same manner, but significantly improved when 0.3% NaDF were added in the diet ($p<0.05$). Due to this dietary treatment (0.3% NaDF), also protein efficiency ratio and protein retention efficiency were significantly improved. This observed advantage of the diet with 0.3% NaDF was also supported by complex protein quality parameters yielded from application on an exponential N-utilization model, eliminating the influence of varying feed intake on response of protein deposition. In conclusion, the observed beneficial effect of added salts of formic acid on feed and nutrient efficiency of a low fishmeal Tilapia feed was significant with 0.3% of sodium diformate (NaDF) in the diet. These findings under experimental conditions with high hygienic standards led to the expectation of more pronounced beneficial effects under environmental conditions of applied Tilapia culture.

Keywords: Potassium diformate; Sodium diformate; Tilapia; Growth; Nutrient utilization

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