

Effects of dietary potassium diformate on juvenile white-leg shrimp *L. vannamei* on feed efficiency and survivability - a performance analysis

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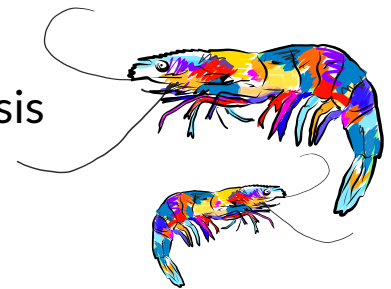


Fig. 1: Shrimp after harvest

Introduction

Global intensive production of the white leg shrimp, *Litopenaeus vannamei* (Boone 1931), in Central America and SE Asia is estimated to have reached 5.6 million t in 2023. In such intensive aquaculture production, bacterial diseases have been identified as a major cause of economic loss to producers. Feeding antibiotic-medicated feeds used to be a common practice to treat bacterial infections and the prophylactic use of antibiotics as growth promoters in aquaculture production has also been widely applied. However, growing awareness from both consumers and producers of all species grown in aquaculture has resulted in the current demand for responsible and sustainable aquaculture. Dietary organic acids, and especially potassium diformate, which is the most widely tested organic acid salt in aquaculture, are among the various alternatives for environmentally friendly and nutritive-sustainable aquaculture approaches. This study analyzed the average impact of potassium diformate (KDF, traded as AQUAFORM, ADDCON), based on data collected from the published studies on its effects on performance parameters, such as feed efficiency and survival rate, thus combining the most important parameters in shrimp production.

Material & Methods

The final dataset contained the results of 9 published studies in which KDF was included, at dosages ranging from 0.1% to 0.8% and covered laboratory trials as well as usage under commercial conditions. Data were subjected to statistical analysis and a significance level of 0.05 was used in all tests. Results are expressed as percentage difference from the negatively controlled white-leg shrimp.

Results and conclusions

The average level of dietary potassium diformate from the dataset in all treated *Vannamei* shrimp was 0.33%. The performance of the white-leg shrimp (Tab. 1), based on feed efficiency was significantly improved by 13.8% ($P < 0.05$). Furthermore, the survival rate of the shrimp was highly significantly increased ($P < 0.01$): this time the improvement was around 13.0%.

Table 1: Average impact (Meta-analysis of 9 trials) of dietary potassium diformate (AQUAFORM, KDF) on feed efficiency and survival rate in juvenile white-leg shrimp

	Neg. Control	KDF	Difference [%]	P-value
FCR	1.92±0.72	1.66±0.46	-13.8	0.034
Survival [%]	80.6±16.2	91.1±13.3	+13.0	0.003

In general, results show significantly improved performance data in *Vannamei* shrimp fed with dietary potassium diformate. These findings support the use of KDF in shrimp feeding as a promising alternative in ecologically sustainable and resource-optimized shrimp production.