Impact of drinking water acidification in broilers – a continental performance analysis

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Introduction

The use of acidifiers in drinking water is a relatively recent development in poultry production, propelled by cost-efficiency and the implementation of various antibiotic reduction strategies. Organic acids, in particular formic acid and its salts, are well known to improve productivity in animal nutrition. The potential for organic acids to improve the water quality lies in their ability to protect against microbial contamination. This is especially crucial in rural tropical areas, often the centre of local poultry production. The use of acidifiers via drinking water will not only create hygienic conditions in the water itself but also lead to improved performance parameters in the birds. Various trials using a drinking water acidifier based on formic acid and sodium formate (ADDCON XL2.0) have been carried out under a wide range of tropical and sub-tropical conditions across Asia.

Material and methods

This study analyzed the average impact of the additive, from all data collected, on the performance parameters weight gain, feed efficiency, mortality and production index from commercial and academic trials. The final dataset contained the results of 8 trials in broilers at inclusion rates ranging from 350 ml to 1000 ml per 1000 L water. These studies were carried out between 2012 and 2023 in Indonesia, Pakistan, Philippines, Thailand and Turkey and included more than 223,000 broilers. The results are expressed as the percentage difference from the negative control and given as means. A confidence level of 95 % was defined for these analyses.

Results

The average dosage of XL2.0 in all treated broilers was 740 ml/1000 L. Average daily gain (ADG) of birds significantly (P=0.007) increased by 5.0% (Table 1), while feed efficiency (FCR) was significantly improved by 3.7% (P=0.009). An immensely reduced mortality rate was noticed (-17.1%; P=0.02). The resulting overall productivity index (EBI) was highly significant (P=0.0001) increased by 10.2%.

Table 1: Average impact (Meta-analysis of 8 trials) of formic acid - sodium formate based drinking water acidifier (ADDCON XL2.0) on broiler performance

Group	ADG [g]	FCR	Mortality [%]	EBI*
Negative control	51±9	1.86±0.43	3.8±2.1	282±94
Acidifier	54±8	1.79±0.37	2.8±1.5	305±91
P-value	0.0074	0.0089	0.0226	0.0001
SD	*146*	*140*	*47*	*40*

*European Broiler Index EBI = ADG [g] × Survival rate [%] / (10 × FCR)

Conclusion

This study demonstrates that, under a wide range of different broiler production conditions throughout Asia, including water acidification in broiler production has beneficial effects on the performance of chickens and may be considered a low-cost sustainable option to improve production parameters with no or lowered antibiotic usage.