

Effects of dietary sodium diformate on growth performance, nutrient digestibility, gut health and profitability in broilers

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Introduction: Dietary formic acid and its salts act against pathogens, helping to decrease pressure on the immune system and improving nutrient digestibility. The use of the double sodium salt of formic acid, with the same antimicrobial properties as formic acid, but with improved handling properties, has become more prevalent in poultry diets. Dietary sodium diformate (NaDF) has been tested in poultry production since 2006 and numerous articles on its use in broilers have been published. This study analyzed the impact of NaDF (traded as Formi® NDF) on growth performance, digestibility parameters, gut health and economic indices in broilers.

Material and methods: The trial was conducted at a research farm in Taiwan. One hundred and twenty day-old male Arbor Acres broilers were randomly allotted into 2 treatment groups, with 3 replications and 20 birds in each pen. The commercially-available corn-soy-based feed in one group contained 0.3% NaDF; this group was compared against a negative control (NC). Feed and water were provided *ad libitum*. Birds were weighed individually after 14 and 39 days; feed consumption was recorded per pen at the end of the trial. The effects of NaDF on performance (final weight, feed conversion ratio, European Broiler Index EBI, Cost of feed per kg gain), protein utilization and villi height were examined after 39 days.

Data were analysed using the t-test and a confidence level of 95% was defined for these analyses.

Results and discussion: Performance was boosted in the birds fed 0.3% NaDF (Table 1). Treated birds were significantly heavier (2551 g vs. 2316 g; $P < 0.05$), while the FCR improved only numerically (1.67 vs. 1.71). Protein utilization was also numerically enhanced (63.3% vs. 61.6%), while the villi height in the jejunum and ileum was significantly increased by between 170 and 450 μm (Figure 1). Finally, the EBI improved considerably due to the inclusion of sodium diformate by 14.9% and the cost of feed per kg gain was reduced by 1.0 USD Cent.

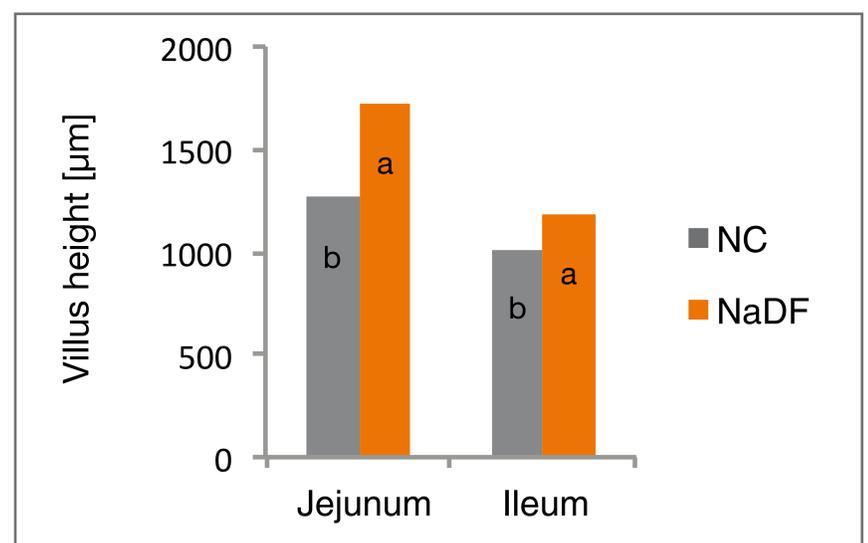


Figure 1: Effect of 0.3% NaDF on gut morphology
Means of bars with different letters differ significantly ($P < 0.05$)

Table 1: Performance parameters of broilers fed with or without NaDF at 0.3% for 39 days

	Negative control	0.3% NaDF	Difference [%]
BW – 14 days [g]	320 ^b	386 ^a	+20.6
Final weight [kg]	2.316 ^b	2.551 ^a	+10.1
ADG [g]	58 ^b	64 ^a	+10.3
FCR	1.71	1.67	-2.3
Mortality [%]	3.33	1.67	-50
EBI*	329	378	+14.9
Cost of feed / kg gain [USD Cent]	0.838	0.828	-1.0 USD Cent

Means with a different superscript differ significantly at $P < 0.05$

*EBI = Daily weight gain [g] x Survival [%] / 10 x FCR

This study demonstrates that including sodium diformate in broiler diets is beneficial to performance, nutrient utilization and gut health and thereby increases the gross profit of broiler operations.