

## Impact of dietary sodium diformate on layer performance and health under farm conditions in Nigeria

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**Introduction:** Microbiological integrity of eggs is an important issue, while bacterial pathogens in feed and environment of layer units can have serious consequences for bird health and productivity, especially in tropical regions, where higher environmental temperatures and humidity allow pathogens to thrive. Organic acids have long been used in animal nutrition to stabilize feed and enhance animal performance. Early studies on these additives were carried out in pig production; however they have been increasingly adopted in the layer industry since the early 1990's. Sodium diformate (NDF) has been widely used in poultry production in tropical areas since 2009. However, its impact under layer production systems in Africa was yet to be thoroughly investigated. This formed the impetus for the current study – a commercial trial in Nigeria.

**Material and methods:** The trial was conducted at a commercial layer farm in Nigeria. 2100 laying hens were randomly allotted into 2 treatment groups, with 1050 birds per group. The impact of 0.3% dietary NDF addition to a commercial layer diet on performance and health in laying hens from 55 weeks of age was studied over a period of eight weeks. Data were analysed using the t-test and a confidence level of 95% was defined for these analyses.



**Results and discussion:** In general, the overall feed intake was acceptable for local conditions throughout the trial. However, feed intake over the 56-day trial period was lower in the birds that received the NDF diet (119 v. 122 g/bird/day;  $P < 0.001$ ; Table 1). On the other hand, hen day egg production improved highly significantly ( $P < 0.001$ ) over the same period, with 85.9% v. 77.7 % in NDF and control groups, respectively. The average number of eggs laid over the experimental period was 57,518 in the group given the NDF diet, compared to only 51,047 in the control group ( $P < 0.001$ ). At the end of the trial, total egg weight was 3,510 kg in the NDF group, compared to 2,910 kg in the controls, although due to the collection method, no statistical comparison was possible. Finally, the use of the additive led to significantly reduced mortality of 0.7 v. 3.8 % in the NDF and control groups, respectively ( $P < 0.001$ ).

**Table 1:** Performance data of laying hens fed with or without 0.3% sodium diformate (NDF) for eight weeks

	Control	0.3% NDF	Difference [%]
Feed intake [g/d]	121.7±1.4 <sup>A</sup>	119.5±0.3 <sup>B</sup>	-1.8
Σ laid eggs during trial [n]	51,047±35 <sup>A</sup>	57,518±65 <sup>B</sup>	+12.7
Σ egg weight during trial [kg]	2,910	3,510	+20.6
Avg. egg weight [g]	57.0	61.0	+7.0
Hen day egg production [%]	77.7±4.2 <sup>A</sup>	85.9±6.3 <sup>B</sup>	+10.6
Feed [kg] per kg egg weight	2.46	2.00	[-460 g]
Mortality [n]	40±0.9 <sup>A</sup>	7±0.4 <sup>B</sup>	-82.5

<sup>A,B</sup> Means with a different capital superscript differ highly significantly at  $P < 0.001$

These data show that sodium diformate (traded as FORMI NDF) is able to improve performance and survival rates in layers under commercial tropical conditions in Nigeria and may thus be a viable alternative for antibiotic inclusion in feed.