

# Final Report

## Introduction

The fruit of *Morinda citrifolia* or Noni, used in traditional Polynesian and Asian herbal remedies, has received considerable attention as a dietary supplement. The benefits of Noni range from antimicrobial and immune modulation properties to being an adaptogen that promotes health and well-being (Wang et al. 2002). The efficacy of Noni as a supplement for farm animals under intensive production systems has not been explored. A recent limited experiment was conducted with weaned pigs that were drenched with 5 ml liquid Noni supplement twice daily from 5-23 kg live weight. The treatment markedly enhanced pig performance and this prompted interest in Noni as a possible supplement for poultry.

Broiler chickens were selected because of their rapid early growth. Broiler chicks average 40-41 g at day-old and the increase is 3.8, 2.6, 1.8, and 1.6 times the previous weeks weight at 1, 2, 3 and 4 weeks of age. Hence a two week experiment represents a period of intense growth and adjustment to the environment. Under praxis conditions a dietary supplement that attenuates the effects of stressors and or improves livability, growth and/or feed efficiency has tremendous market potential. The purpose of the study was to evaluate Noni test material provided by Morinda® in broiler starter diets.

## Materials & Methods

Day-old chicks from Fieldale Farms Corporation, Baldwin, GA were wing-banded, weighed and allotted to 24 wire-floored pens in 8 blocks on the basis of initial body weight. The brooder units were maintained in an environment-controlled room with airflow of 60 m<sup>3</sup>, 18 air changes per hour, and 24 hour photoperiod. The chicks were observed twice daily and water vessels cleaned and refilled daily. Feed and water were provided ad libitum.

The chicks were fed a standard starter diet (control) and liquid Noni supplement (Lot # RD39-006-01) added at 1 and 2% in the basal diet. The starter diet contained 58.25% yellow corn, 35% soybean meal, 3.4% poultry fat, 1.4% dicalcium phosphate, 1.1% calcium carbonate, 0.25% common salt, 0.25% vitamin premix, 0.15% choline chloride premix, 0.15% DL-methionine, and 0.05% trace mineral mix. Due to lack of information on stability of the Noni supplement, 150 kg of the control diet was prepared and experimental diets with Noni puree prepared weekly. Feed consumption, body weight, and livability were measured at 2 weeks of age. Broilers are grown on litter and excreta moisture is important for litter condition, bird health, and quality of poultry meat and hence excreta dry matter was measured on days 13-14.

The experiment consisted of three treatments (0, 1, and 2% Noni puree) that were randomly assigned to pens in a randomized complete block design with 8 blocks. A pen of 8-9 birds constituted the experimental unit. Body weights, at day-old and 14 days of age, were recorded on an individual basis. The data were subjected to analysis of variance using  $\alpha=0.05$ , and orthogonal polynomial contrasts were used to examine response to dose of test material (0, 1 and 2%). In the case of body weight data, the individual values were used to remove the bird to bird variation within each experimental unit and treatment effect tested with the appropriate error term. Means and standard errors are presented in the results section.

## Results

**Table 1. Performance of broiler chicks fed Noni feed supplement from day-old to 14 days**

Response variable	Amount of Noni supplement <sup>1</sup> in diet (%)			SEM
	0	1	2	
Body weight at day-old, g	42.2	42.0	42.2	± 0.15
Body weight at 14 days <sup>2</sup> , g	320	326	340	± 10.4
Feed conversion, g feed/g gain	1.14	1.16	1.15	± 0.011
Feed/bird-day from 0-14 days, g	26.1	26.7	27.8	± 0.83
Mean daily gain in weight, g	19.8	19.9	21	± 0.77
Excreta dry matter, %	42.0	43.5	43.6	± 1.77

<sup>1</sup>Noni animal feed supplement provided by Morinda® (Lot # RD 39-006-01)

<sup>2</sup> Linear contrast (P=0.19)

Statistically significant (P<0.05) treatment differences in the response variables measured were not detected. There were no abnormalities observed in birds fed the test material at 1 or 2% of the diet and the use of Noni feed supplement did not increase excreta moisture content. Even though a statistically significant treatment effect was not detected for body weight there was a trend of 6% improvement in body weight at 2% Noni feed supplement.

The results clearly demonstrated the Noni feed supplement had no adverse effects in terms of behavior, bird condition, moisture excretion, growth, and feed efficiency. It is conceivable that the trend toward improvement in growth of 6% under ideal environmental conditions, in an AAALAC accredited animal research facility, may translate to higher statistically detectable gains under praxis conditions when birds are reared on litter, especially used litter.

### Conclusion & Recommendation

1. Noni feed supplement did not have an adverse effect when included at up to 2% in the diet.
2. A trend in improvement in body weight (6% gain) was evident in birds fed the Noni feed supplement at 2%.
3. Recommend further research to examine the effects of Noni feed supplement on bird performance when grown on used litter, on selected responses in a model of chronic oxidative stress, and on immune responses.

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