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The Chairman,
Grant Review Committee,
NASENI, Abuja

Dear Sir,

LETTER OF INTENT TO SUBMIT A RESEARCH PROPOSAL

I write to express my intent to submit a research proposal titled "**Molecular Evaluation of the immunomodulatory effect of common phytogenics on broiler chickens as assessed by the expression profiles of certain pro and anti-inflammatory genes."** This proposed study seeks to investigate the molecular mechanisms through which common phytogenic extracts (Drumstick tree (*Moringa oleifera)*, Neem (*Azadirachta indica)*, *Garlic* (*Allium sativum)*, scent leaf (*Ocimum gratissimum*), bitter leaf (*Vernonia amygdalina*), lemon grass (*Cymbopogon citratus*), clove (*Syzygium aromaticum*), eucalyptus (*Eucalyptus globulus*), cinnamon (*Cinnamomum verum*), Tumeric (*Curcuma longa*) and ginger (*Zingiber officinale)*) influence the health, performance, and immune competence of broiler chickens. Specifically, the project will evaluate the expression patterns of core pro- and anti-inflammatory genes in broiler chickens fed the extracts in their drinking water.

The increasing restrictions on antibiotic growth promoters (AGPs) in poultry production have created an urgent need for natural alternatives that ensure productivity and animal welfare. Phytogenics have been reported to have immunomodulatory and growth-promoting effects, but their precise dose-response relationships and molecular impact on immune-related gene expression in broilers remain underexplored. This study will fill a critical knowledge gap by linking phytogenic supplementation to molecular immune responses, providing science-based evidence for their integration into sustainable poultry production systems. The study will be undertaken with the following specific objectives

1. standardize and validate the extraction protocols for aqueous extracts of the selected phytogenics,
2. assess the impact of phytogenic extracts on growth and carcass characteristics of two strains of broiler chickens,
3. assess the effect of phytogenic treatments on the blood profile and immune biomarkers of the chickens,
4. establish dose-response relationships and optimal administration strategies for each extract or their synergistic combinations in two strains of broiler chickens,
5. characterize the changes in mRNA expression levels of selected proinflammatory (IL-1β, IL-6, TNF-α, IFN-γ) and anti-inflammatory (IL-4, IL-10, TGF-β) cytokine genes in broiler lymphoid and caecal tissues following phytogenic supplementation.
6. appraise the potential of optimized phytogenic supplementation as a replacement for antibiotics in the Nigerian poultry systems and inform industry recommendations and regulatory policies; and
7. develop an organic growth promoter and immune booster (Nasboost®) for broiler chickens in Nigeria.

The methodology will involve controlled feeding trials with broiler chickens assigned to treatments with specific phytogenic extracts or their combinations. Tissue sample from the caecum will be collected for RNA extraction and quantitative real-time PCR (qRT-PCR) analysis of target immune genes. Statistical analyses will be performed to establish significant differences and correlations between treatments and molecular responses.

This research will provide novel insights into the immunomodulatory mechanisms of phytogenics at the molecular level.

The findings are expected to:

- Support the development of phytogenic-based strategies for enhancing poultry health and productivity.
- Contribute to reducing reliance on antibiotics in poultry production, aligning with global calls for antimicrobial resistance (AMR) mitigation.
- Finally, a standardized natural phytogenic product (Nasboost®) with scientifically validated immune-enhancing and growth-promoting properties for broiler production will be developed for commercial use.

I believe that the proposed project aligns closely with NASENI's mission to support innovative research that advances sustainable livestock production, food security, public health, and the Renewed Hope Agenda. Nasboost, a **phytogenic extract solution**, will occupy a niche market segment that is likely to grow in importance due to the global movement towards antibiotic-free and natural animal products. As a locally produced immune booster and growth promoter, Nasboost could potentially be positioned as a more accessible and cost-effective alternative to imported additives, which are often subject to fluctuating exchange rates and import duties. A full proposal, including detailed methodology, timeline, and budget, has been submitted.

Thank you for considering this Letter of Intent. I look forward to the opportunity to contribute to advancing sustainable poultry production through molecular biotechnology in Nigeria and beyond.

Yours faithfully,

Abdulrazaq Raji (Ph D)