

REVIEWER'S REPORT

Manuscript No.: IJAR-56671

Title: Stability Monitoring of Phytogetic Constituents and Physicochemical Properties of Pulmofarm® T Herbal Respiratory Premix during Feed Pelletization Stress

Recommendation:

Accept as it is
 Accept after minor revision.....
 Accept after major revision
 Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality	...			
Techn. Quality		...		
Clarity	...			
Significance	...			

Reviewer's ID: JPR-180

Detailed Reviewer's Report

The research paper titled "Stability Monitoring of Phytogetic Constituents and Physicochemical Properties of Pulmofarm® T Herbal Respiratory Premix during Feed Pelletization Stress" focuses on evaluating the stability of a polyherbal feed additive under industrial feed processing conditions. The study is situated within the fields of animal nutrition, veterinary science, and phytopharmaceutical research. It addresses a critical issue in livestock production whether herbal feed additives retain their chemical integrity and therapeutic efficacy when exposed to high temperature and moisture during feed pelletization. The author highlights that feed constitutes a major portion of livestock production costs and that pelletization, while beneficial for feed quality and digestibility, may adversely affect sensitive phytogetic compounds. Therefore, the central objective of the study is to assess the stability of key bioactive constituents in Pulmofarm® T Premix under simulated pelletization stress conditions. The introduction provides a comprehensive background on respiratory diseases in livestock and the growing use of phytogetic feed additives as natural alternatives to synthetic drugs. The author explains that livestock animals are highly susceptible to respiratory disorders caused by pathogens, environmental stressors, and management practices. In this context, herbal formulations like Pulmofarm® T Premix are increasingly used due to their immunomodulatory, antimicrobial, and bronchodilatory properties. The formulation contains bioactive compounds such as glycyrrhizin and thymol, derived from medicinal plants like Glycyrrhiza glabra and Trachyspermum ammi, which contribute significantly to respiratory health. The introduction also emphasizes the importance of maintaining the stability of these compounds during feed processing, as degradation could reduce the product's efficacy.

The paper effectively identifies a research gap by noting that limited studies have examined the stability of herbal feed additives under pelletization conditions. While feed processing techniques like pelleting improve feed efficiency and handling, they involve exposure to elevated temperature and moisture, which may compromise the chemical stability of phytogetic constituents. The author therefore justifies the need for a systematic stability assessment using reliable analytical techniques. The study specifically focuses on glycyrrhizin and thymol as marker compounds due to their pharmacological relevance and contribution to the therapeutic activity of the formulation. The results of the study indicate that the Pulmofarm® T Premix remains stable under the applied pelletization conditions. The physicochemical parameters show no significant variation between the control and treated samples, suggesting that the basic composition of the formulation remains intact. Chromatographic analysis reveals that the concentrations of glycyrrhizin and thymol exhibit only minimal variations (within acceptable limits), with no significant degradation observed. The retention times, peak areas, and spectral profiles remain consistent across all samples, indicating chemical stability. Furthermore, HPTLC fingerprint analysis confirms the absence of new

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degradation products, as the band patterns and chromatographic profiles remain unchanged. These findings collectively demonstrate that the formulation maintains its chemical integrity even under thermal and moisture stress.

The paper also highlights the effectiveness of chromatographic techniques such as RP-HPLC-PDA and HPTLC in stability assessment. These methods provide accurate, sensitive, and reproducible results, making them suitable for analyzing complex herbal formulations. The study contributes to the development of standardized analytical protocols for monitoring the stability of phytogenic feed additives, which is essential for ensuring product quality and regulatory compliance. The conclusion of the paper succinctly summarizes the key findings and their practical implications. It confirms that Pulmofarm® T Premix is stable under pelletization stress conditions and can be safely incorporated into pelleted feed without significant loss of its active constituents. The study also emphasizes the importance of stability monitoring in the development and commercialization of herbal feed additives. By providing scientifically validated evidence, the research supports the use of phytogenic formulations as reliable and effective alternatives in animal health management.

Overall, the paper makes a valuable contribution to the fields of animal nutrition and phytopharmaceutical research. It successfully combines experimental analysis with practical relevance, addressing a key challenge in the use of herbal feed additives. The study is methodologically robust, well-structured, and supported by reliable analytical data. It provides useful insights for researchers, feed manufacturers, and veterinary professionals interested in improving livestock health through natural and sustainable approaches.