

Formulation of Enhanced Animal Feed using Extrusion Processing

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Abstract

In recent years, there has been a growing interest in developing innovative strategies to enhance the nutritional quality and health benefits of animal feeds. Phytochemicals derived from plants have demonstrated various bioactive properties, including antimicrobial, antioxidant, and immunomodulatory effects. However, incorporating these compounds into animal feeds while preserving their efficacy poses a challenge due to their sensitive nature. The current study focuses on the formulation of bioactive feed extrudates containing phytochemicals through extrusion processing to address this challenge. Specifically, a combination of essential oils from oregano, rosemary, chamomile, and hypericum (EOB) was examined and integrated into the standard feed through a co-rotating twin-screw extruder. The bioactive feed formulation was analyzed and compared to the conventional corn flour-based feed, before and after the extrusion process. All extrudates were thoroughly evaluated in terms of extrusion efficiency, morphology, physicochemical characteristics, bioactivity, and EOB release rate. Results revealed that the bioactive extrudates exhibited a satisfactory overall behavior in terms of stability and mechanical properties. This study reveals the feasibility of creating enhanced feed by incorporating the essential oil blend (EOB) studied into the conventional feed blend through extrusion cooking. These findings contribute significantly to the ongoing efforts towards replacing synthetic feed additives through a novel and sustainable approach.