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The Product Innovation Using Nutraceutical Delivery System on Improving Growth Performance of Broiler

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Abstract : The product innovation using a nutraceutical delivery system on improving the growth performance of broilers is the product planning and development to solve the antibiotics banning policy incurred in the local and global livestock production system. Restricting the use of antibiotics can reduce the quality of chicken meat and increase pathogenic bacterial contamination. Although other alternatives were used to replace antibiotics, the efficacy was inconsistent, reflecting on low chicken growth performance and contaminated products. The product innovation aims to effectively deliver the selected active ingredients into the body. This product is tested on the pharmaceutical lab scale and on the farm-scale for market feasibility in order to create product innovation using the nutraceutical delivery system model. The model establishes the product standardization and traceable quality control process for farmers. The study is performed using mixed methods. Starting with a qualitative method to find the farmers' (consumers) demands and the product standard, then the researcher used the quantitative research method to develop and conclude the findings regarding the acceptance of the technology and product performance. The survey has been sent to different organizations by random sampling among the entrepreneur's population including integrated broiler farm, broiler farm, and other related organizations. The mixed-method results, both qualitative and quantitative, verify the user and lead users' demands since they provide information about the industry standard, technology preference, developing the right product according to the market, and solutions for the industry problems. The product innovation selected nutraceutical ingredients that can solve the following problems in livestock; bactericidal, anti-inflammation, gut health, antioxidant. The combinations of the selected nutraceutical and nanostructured lipid carriers (NLC) technology aim to improve chemical and pharmaceutical components by changing the structure of active ingredients into nanoparticle, which will be released in the targeted location with accurate concentration. The active ingredients in nanoparticle form are more stable, elicit antibacterial activity against pathogenic Salmonella spp and E.coli, balance gut health, have antioxidant and anti-inflammation activity. The experiment results have proven that the nutraceuticals have an antioxidant and antibacterial activity which also increases the average daily gain (ADG), reduces feed conversion ratio (FCR). The results also show a significant impact on the higher European Performance Index that can increase the farmers' profit when exporting. The product innovation will be tested in technology acceptance management methods from farmers and industry. The production of broiler and commercialization analyses are useful to reduce the importation of animal supplements. Most importantly, product innovation is protected by intellectual property.

Keywords : nutraceutical, nano structure lipid carrier, anti-microbial drug resistance, broiler, Salmonella
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