

REVIEW ARTICLE

NUTRACEUTICAL AND PHARMACEUTICAL IMPLICATION OF PREBIOTICS IN LIVESTOCK AND POULTRY FEED

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In poultry production, dietary prebiotics viz. dietary organic acid (OA) supplements, mannan oligosaccharide (MOS), β -glucan and xylanase supplementation are mainly used in order to enhance live body weight gain, dressing percentage, weight of vital organs and muscles and mean villus lengths in digestive tract of poultry birds. Prebiotics can also act as immunostimulants. The term immunostimulant can be used interchangeably with immunomodulator, adjuvant and biological response modifier. Immunostimulators can be in the form of drugs and nutrients. This article highlights role of prebiotics and their physiological implications on body performance.

Key words: Feed, Immunostimulation, Nutraceutical, Prebiotics, Poultry.

INTRODUCTION

Prebiotics are non-digestible feed ingredients that beneficially affect the host by selectively stimulating the growth or activity of one or a limited number of bacterial species, already resident in colon (**Figure 1**) and thus attempt to improve host health (Gibson and Roberfroid, 1995; Ganguly and Mukhopadhyay, 2011; Rashid *et al* 2012). Mainly prebiotics are small fragments of carbohydrates and commercially available as oligosaccharides of galactose, fructose or mannose (Ganguly, 2013a).



Fig. 1. Marketed prebiotics containing products

Among these, mannan oligosaccharide obtained from *saccharomyces spp.* of yeast outer cell wall maintain gut health by adsorption of pathogenic

bacteria, containing type-I fimbriae or by agglutinating different bacterial strains and increase villi length uniformity and integrity. Effects of buffered propionic acid in presence and absence of bacitracin or roxarsone were reported earlier in which significant increase in dressing percentage for female broilers and a significant reduction in abdominal fat of males at 49 days tested the effect of dietary lactic acid on performance of broilers from 0 to 6 weeks age. Body weight gain tended to be greater, whereas feed to gain ratios were significantly improved where birds were fed 2% lactic acid as prebiotic. Beneficial effects of different organic acids like formic acid, propionic acid, lactic acid ammonium formate and calcium propionate etc. as growth promoter and prebiotic have been studied earlier for having substitute to antibiotic. The effect of yeast cell wall preparation (of *Saccharomyces cerevisiae* origin) as an immunomodulator of the innate immune response was revealed (Paul *et al* 2012). To evaluate its effect on chicken, yeast cell wall preparation (Nutriferm™) was administered orally to 1 week old broilers @ 0.4 g and 0.8 g per kg feed for 15 days and then switched back