Effects of dietary levels of yeast extracted β-glucans and α-mannans (Alphamune™) on performance of broiler chicken raised in normal and thermal-stressed conditions

Einfluss des Zusatzes von aus Hefe extrahierten β-Glukanen und α-Mannanen (Alphamune™) zum Futter auf die Leistung von Broilern bei Haltung unter normalen und Hitzestress-Bedingungen

A. Cheraghi, H. Khosravinia, S.M. Mousavi and B. Massori

Dept. of Animal Science, Faculty of Agriculture, Lorestan University, Khoramabad, Lorestan, Iran

Correspondence: khosravi_fafa@yahoo.com

Introduction

The increasing expansion of the ban on using antibiotics as growth promoters in broiler diets (SORUM and SUNDE, 2001) and the growing concern of consumers about antimicrobial residues in meat (BURGAT, 1999), have given high priority to research into promising alternative feed additives for poultry nutrition. Many research works have been performed for non-antibiotic feed additives which can prevent diseases, promote growth and reduce harmful side effects, with no medical residues and resistances.

Beta-glucans which are derived from the cell wall of yeast, bacteria and fungi are considered as prebiotic feed additives in human (TZIANABOS, 2000), mice (CLEARY et al., 1999), pigs (SOHN et al., 2000; MAO et al., 2005), poultry (HUFF et al., 2006) and some marine animals (SOHN et al., 2000; SUPHANTHARIKA et al., 2003). An extensive body of literature has shown immuno-modulating effects for β-glucans when the animals are challenged with Venezuelan equine encephalomyelitis (REYNOLDS et al., 1980), bacterial and parasitic infections caused by Staphylococcus aureus and Eimeria vermiformis (YUN et al., 2003) and Eimeria oocysts (LU et al., 2014).

Mannan oligosaccharides (MOS), as another class of probiotic feed additives that have also shown promising effects, such as decreasing pathogenic microflora in the gut (SPRING et al., 2000; KOCHER et al., 2005), stimulating a strong immune response (SPRING, 1999a; SPRING, 1999b) and elevating the strength of the intestinal mucosa in studies with poultry (JI et al., 2001). Through balancing the intestinal microflora and stimulating the immune response, MOS supplementation to broiler diets improves growth performance in terms of body weight gain and feed conversion (SPRING, 1999a; HOOG, 2004; ROSEN, 2007). It was observed that birds fed MOS are better able to withstand the challenge (SPRING et al., 2000). The bacterial populations in the gut of birds were altered when MOS were added to their diets (YANG et al., 2007; YANG et al., 2008b). By contrast, there are some researches demonstrating that growth performance was not significantly influenced by the addition of MOS (YALCINKAYA et al., 2008; YANG et al., 2008a).

Despite of extensive literature on immuno-modulating and growth promoting effects of individual β-glucan- and α-mannan-containing feed additives in poultry research, accomplishment of both compounds in a single feed additive was not apprehended until a commercial product containing an elite composition of yeast wall extracted β-glucans and α-mannans called Alphamune was introduced. This product supposes to act as an growth promoter in young farm animals. Two trials were conducted to investigate the effects of different dietary levels of Alphamune on productive performance in broiler chicken raised under normal or thermal-stressed conditions.