

# A Polyherbal formulation to control bacterial enteritis in poultry: a case report in *Salmonella enteritidis* induced experimental model

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## Abstract

An experimental study was conducted in day old 150 VenCobb chicks to evaluate efficacy of polyherbal formulation in induced bacterial enteritis with *Salmonella enteritidis*. Birds were randomly divided into three groups: negative control, positive control & infected & prophylactically treated group with AV/ADC/16 (14th-28th days). *Salmonella* infection was induced on day 21st. A significant decrease in overall growth, productivity, feed conversion & mortality was evident in untreated infected group in addition to severity of clinical signs. However, prophylactic administration of herbal formulation inhibited mortality & clinical symptoms were mild to negligible. No negative effect on growth & performance was observed in treated group III.

## INTRODUCTION

Colibacillosis, necrotic & hemorrhagic enteritis are some of the infectious diseases affecting digestive system in poultry. Problems may range from severe acute infections with sudden death or high mortality to mild infections of a chronic nature with low morbidity and mortality. Specific & non-specific enteritis is one of the most economically important since it has been shown to impair feed conversion in broilers (Stutz and Lawton, 1984). Antibacterial feed additives such as bacitracin, virginiamycin, penicillin etc. (Ficken and Wages, 1997; George et al., 1982; Maxey and Page, 1977; Stutz and Lawton, 1984, Watkins et al., 1997) and the ionophore anticoccidial agents (Prescott and Baggot, 1993) was the most obvious choice of practitioners to treat infectious enteritis before their restricted usage by European Union (EU) in 1999. But after this prohibition by EU, many countries many countries have experienced necrotic enteritis in near epidemic proportions (25-40%) in broiler flocks (Kaldhusdal and Lovland, 2000). There are alarming concerns by consumers and also government health officials regarding the use of these antibiotics in food producing animals due to the potential transfer of antibiotic resistance to human bacterial pathogens. The consequence of these actions is limiting or eliminating use of antibiotic growth promotants in many broiler-producing areas of the world. Therefore, new methods of prevention of necrotic

enteritis must be investigated. Current study is designed to evaluate efficacy of polyherbal formulation in induced bacterial enteritis in broilers.

## MATERIAL & METHODS

A five weeks experimental study was conducted in a poultry farm at Kashipur, Dist, U.S.Nagar, and Uttaranchal, to evaluate prophylactic efficacy of polyherbal antidiarrhoeal formulation AV/ADC/16 in *Salmonella enteritidis* induced enteritis in broilers. Total numbers of one hundred fifty unsexed day old chicks of nearly similar live body weight were divided into three groups randomly (n=50) and kept under similar environmental & managerial conditions upto 14 days age for acclimatization. Group I was non-infected, non-medicated, negative control. Group II, positive control (infected and non-medicated). Group III (infected and medicated) was prophylactic treatment group with polyherbal formulation AV/ADC/16 (supplied by M/S Ayurved Ltd.) @ 2 kg/tonne of feed, supplemented alongwith basal diet, from 14 days up to 28 days age. Infection in Group II & III was induced with 106 CFU of *Salmonella enteritidis* virulent strain by intra-cloacal route at the age of 21 days. Observations of clinical symptoms, growth & performance parameters & recovery from bacterial diarrhoea were recorded till the end of experimental study.

## RESULT & DISCUSSION

The clinical signs of enteritis; loose faeces, foul odour, ruffled feathers, hemorrhagic enteritis, loss of appetite, reduced feed intake, dullness & depression started appearing in group II & III, within 24 hour post-inoculation of infection. The clinical signs were persistent in untreated group II. Recovery in treated group III was observed within 3-4 days post infection. The cumulative body weight & feed efficiency was low & mortality % was higher in infected non-medicated group II at the end of 5 weeks. Average feed intake was 2620gm, 2205 gm and 2600 gm and feed efficiency (FCR) was 1.78, 2.4 and 1.93 for group I, II and III respectively, indicating that feed intake was reduced in infected non-medicated birds (group II) while prophylaxis with polyherbal formulation AV/ADC/16 improved feed efficiency and average feed intake. At 5 weeks of age, mean body weight of prophylactically treated birds was significantly higher ( $1350 \pm 1.78$ gm) than the infected birds ( $1000 \pm 2.04$ gm) while that of non-infected, non-medicated group was  $1470 \pm 1.51$ gm. Haematological profile of treated group was also observed to be normal when compared to positive control. Heavy mortality upto 32% was observed in infected untreated group, however it was negligible in group I & III. Histopathological studies revealed septicemic changes in liver, kidney spleen & heart of infected non-medicated birds while no such changes were observed in the treated group. From the present experimental study, it can be concluded that pharmaco-active constituent herbs of AV/ADC/16 alleviates diarrhoeac symptoms by adsorption and inactivation of enterotoxins & protecting gastro-intestinal mucosa without any adverse effects and improves overall performance of birds in terms of growth rate & feed efficiency. (Gupta et al., 1992 Jolly et al., 1996; Rege et al., 1989; Sack et al., 1982) also reported antidiarrhoeal, gastroprotective & immunostimulating activities of major constituent herbs viz. *Holarrhena antidysenterica*, *Andrographis paniculata*, *Tinospora cordifolia*, *Berberis aristata*; of polyherbal formulation AV/ADC/16. The

polyherbal formulation can be recommended

@0.5-1kg/tonne of feed prophylactically & 1.5-2kg therapeutically, preferably as a co-therapy for treatment of bacterial enteritis in poultry.

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