



## HERBAL AND PLANT DERIVED NATURAL PRODUCTS AS GROWTH PROMOTING NUTRITIONAL SUPPLEMENTS FOR POULTRY BIRDS: A REVIEW

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### ABSTRACT

The plant derived and herbal growth promoters supplemented in the diet or added in the drinking water in the broiler and poultry birds have a promising biological effect on their growth performance, to reduce the pathogenic bacteriological load in different parts of digestive tract and to increase villus height in different segments of small intestine mainly in duodenum.

**Key words:** Broiler, Growth promoter, Herbal, Plant derived, Poultry

### INTRODUCTION

Herbal feed additives (often also called phytobiotics or botanicals) are commonly defined as plant-derived compounds incorporated into diets to improve the productivity of livestock through amelioration of feed properties, promotion of the individual production performance, and improving the quality of food derived from those animals, such as herbs (flowering, non woody, and non persistent plants), spices (herbs with an intensive smell or taste commonly added to human food), essential oils (volatile lipophilic compounds derived by cold expression or by steam or alcohol distillation), or oleoresins (extracts derived by non aqueous solvents). Within plant derived feed additives, the content of active substances in products may vary widely, depending on the plant part used (e.g. seeds, leaf, root or bark), harvesting season, and geographical origin. The technique for processing (e.g. cold expression, steam distillation, extraction with non aqueous solvents etc.) modifies the active substances and associated compounds within the final product.

### Effect on physiological parameters

The natural herbal growth promoters remain active throughout the gastrointestinal tract and as a consequence, it will exert broad spectrum antimicrobial action, will enhance nutrient utilization by exhibiting improvement in overall growth performance of broilers and by augmenting the gastrointestinal histomorphology thereby enhancing the host immunity.<sup>1</sup>

### Research findings on related aspect

Jamroz and Kamel<sup>2</sup> who observed improvements in daily weight gain (8.1%) and in feed conversion ratio (7.7%) of chickens when feed with diets supplemented (300mg/kg) with a plant extract containing capsaicin, cinnamaldehyde and carvacrol. Biavatti et al.<sup>3</sup> reported *Alternanthera brasiliensis* extracts (180 ml/200 kg feed) improved broiler performance from 14 to 21 days. Hernandez et al.<sup>4</sup> studied that blend of essential oils of cinnamon, pepper and oregano compounds improved digestibility of nutrients in chicken. In

chicken the benefit of some natural substances on gastrointestinal enzymatic activity, which most likely improves the nutrient digestibility.<sup>5</sup>

Burt<sup>6</sup> stated microbial analysis of minimum inhibitory concentration (MIC) of plant extracts from spices and herbs, as well as of pure active substances revealed levels that considerably exceeded the dietary doses when used as phyto-genic feed additive. Aksit et al.<sup>7</sup> reported antimicrobial action of phyto-genic feed additive may be in improving the microbial hygiene of carcass.

Batal and Parsons<sup>8</sup> indicated that micronutrients also influenced the morphology of intestines. They observed an increased height of villi of jejunum in broilers at 28<sup>th</sup> day of age when fed with 5g BioMos/kg from 7 to 28 day. Jamroz et al.<sup>9</sup> have conducted a study that phyto-genic formulations contained pungent principles (e.g. capsaicin) significantly increased intestinal mucus production.

An experiment was conducted for evaluating the efficiency or effect of the phyto-genic growth promoter. The phyto-genic growth promoter was active throughout the gastrointestinal tract and as a consequence, it will exert broad spectrum antimicrobial action, will enhance nutrient utilization by improving gastrointestinal histomorphology and will augment the host immunity. In the experiment, two proven and approved phyto-genic growth promoters, Digestarom 1317 (dosage 150 ppm) and Digestarom 1440 (dosage 800 ppm) AC were fed to the broiler chickens against an antibiotic growth promoter, Bacitracin Methylene Disalicylate (BMD).<sup>10,11</sup>

Digestarom AC is a combination of phyto-genic components with glycerides of short chain fatty acids. Basically, Digestarom AC is a complex of plant extracts and plant essential oils along with monoglycerides, lactic acids and multiglyceride complexes. Being a complex of plant extracts and essential oils, Digestarom AC is hypothesized to stimulate feed intake, intestinal secretion of enzymes and enhance digestibility of nutrients. Additionally, Digestarom AC is anticipated to act as a broad spectrum antimicrobial substances throughout the gastrointestinal tract and promote development of the villus structure of the gut.<sup>10,11</sup>

The aqueous extract and dried powder of *Moringa oleifera* leaf was evaluated on Feed conversion ratio (FCR) in broiler chicks. Fifty No. of day old chicks were kept into 5 groups each contain 10 chicks. First two (T<sub>1</sub> and T<sub>2</sub>) were fed with aqueous extract and dried powder of *Moringa oleifera* respectively each @ 250 mg/kg b.wt. For comparison, a levamisole fed group T<sub>3</sub> was included, to compare the immunomodulatory effect of the preparations of *M. oleifera* with that of a known positive immunomodulator, which was fed @ 10 mg/kg b.wt. The other two groups T<sub>4</sub> and T<sub>5</sub> included in the experimental design served as the vaccinated and unvaccinated control groups' respectively. *M. oleifera* fed groups showed better FCR than levamisole treated groups followed by vaccinated and unvaccinated control groups of chicks. No mortality was recorded in tested groups. Overall *M. oleifera* showed significant (P<0.05) increase in average body weight gain and feed conversion efficiency in the birds.<sup>12</sup>

Akhouri et al.<sup>12</sup> showed that herbal preparations of *Moringa oleifera* leaf extract can be beneficially used as an effective feed supplement in poultry for its encouraging results in relation to total body weight gain and feed conversion efficiency in the broiler chicks. Herbal and naturally obtained plant derived growth promoting agents can also be used potentially before mass vaccination of the chicks for its property of immunomodulation.<sup>1,13,14</sup> Herbal and naturally derived growth promoters from plant sources can be used as a potent replacer of antibiotic growth promoter if used at optimum level.<sup>15</sup>

## CONCLUSION

The plant derived growth promoter enhance productive performance of the broiler in terms of body weight gain with minimum alteration of gut morphology and the possibility of bacterial invasion can be regulated.

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