



## The Use of Enzymes in Poultry Diets trends and Approaches, A Minimum Review

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### Abstract

Approximately 50 years ago, enzymes industry was established to meet different demands from detergents to feeds and foods. Enzymes play an important role in improving the utilization of feed, especially feed materials containing antinutritional factors and high proportion of fiber and undigested materials, especially in young and chickens. Recent research has shown confirmed results in this area, especially with the current trend of using enzymes to improve the utilization of low-nutrient feed materials, particularly when using agro-by products in poultry feed [1-4]. The results suggest that the addition of commercial enzymes for fodder containing agricultural residues such as the by-products of rice (broken rice, rice hulls, rice bran and rice polishing) the age of wheat or the products of distillation of dry grains have improved the benefits of feed, growth recipes and egg production [5-7]. However, in general, results showed that enzymes effectiveness are affected by strain of chickens as enzymes induced pronounced effect on younger ages and on broilers than old chickens and layers, type and composition of diets, dose and type of enzymes and nature of feedstuffs [8]. The addition of enzymes to layer chicken's diets containing maize and soybean gain did not affect egg production and its properties and the activity of pancreatic enzymes [9-15].

**Keywords:** Enzymes; Poultry; Diet

### Recent trend in enzymes utilization

The fluctuation in the prices of feed materials always leads to the search for suitable alternatives to use instead of the traditional feed materials, especially with the recent rise in prices due to increased demand and competition between humans and animals on these sources, giving absolute primacy to meet food needs [7,9,10]. The aim of using non-traditional feed is to reduce production costs. However, the rate of replacement depends on its availability easily and easily in markets or the surrounding environment with attention and caution from the presence of anti-feeding and chemical composition of feed materials. Many non-nutritional substances and sugars found in plant components of feed materials negatively affect the health of the intestines and poultry performance [4,7,16-18]. Non-starch polysaccharides (NSP) are important components of plant cell wall for feed which can't be digested by poultry because of their structural nature and their resistance to hydrolysis in the digestive system [3,19]. In some feeds, the cell wall is difficult to digest, especially fiber,

in addition to reducing the feed energy, which is the main cause of the low nutritional values. The use of these feedstocks is then restricted by NSP contents [7].

This occurs mainly when the fibers are soluble, which has a great ability to absorb water and form a gel in the intestine. This increased viscosity of the food bubble leads to slow passage of food along the digestive system, as well as hinder the efficiency of digestive enzymes and reduce the action and absorption rate of food [20]. Moreover, increased viscosity of food bolus interferes with microorganisms (promotes the growth of harmful organisms because they are a suitable food for them). Generally, enzymes that are able to digest xylans and  $\beta$ -glucan, and many noncancerous sugars make it possible to be used in foods and feeds [20].

The main enzymes used in animal feed, especially stomach monocytes, are protease, amylase, lipase, phytase, as well as enzymes for many noncancerous sugars and cellulose. The newly published results recommended using enzymes in animal feed to

improve the utilization of feed materials, particularly those rich in non-starch polysaccharides or containing phytic acid [3,8-10,20]. Enzymes cocktail (multienzymes) are usually a combination of several various enzymes that are active on a different variety of feed materials. Enzymes that have established efficient in animal feed include xylanase,  $\beta$ -glucanase, arabinoxylanase, cellulose, and phytase [7,8,21-23].

### Mode of action

The objectives of using enzymes as food supplements include (a) increasing the amount of enzymes available to the animal [19]; (b) mitigating the negative influences of anti-nutritional factors, such as  $\beta$  glucan and arabinoxylans [3]; and (c) increasing availability of nutrients and energy and enhancing their absorption from feed components [8,21]. And (d) alter the microbial environment of the gut by raising beneficial organisms at the expense of harmful organisms [6,24-26].

The external enzymes xylanases or exoxylanase improve the availability of complex nutrients. For example, endoxylanase or exoxylanase enzymes work on analyzing xylan units, which are the backbone units of arabinoxylan, into smaller molecules, which produce many valuable effects and make xylose units more disposable [6,27]. They also increase the prevalence of nutrients and their interaction with internal enzymes [3,20]. Endoxylanase enzymes release nutrient constituents of the plant cell wall and are not susceptible to digestion by monogastrics [28,29]. This group of enzymes could reduce the spread of harmful microorganisms in the small intestine as a result of increased rate of passage swallowing [30] and thus improve the utilization of food by reducing competition between beneficial and harmful intestinal microflora and tolerance to heat stress [31] and reduce blood plasma cholesterol [5].

### Conclusion

Enzymes is a useful tool to improve feed utilization, animal performance, immunity through improve gut health and economic efficiency and the mode of action may include reduce gut viscosity of viscous grain, digestibility of nutrients, utilization of nutrients and overcome the anti-nutritional substances.

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