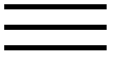


Yeast and yeast derivatives in feed additives and ingredients: Sources, characteristics, animal responses, and quantification methods.

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Animal Feed Science and Technology

Volume 235, January 2018, Pages 60-76

Review Article

Yeast and yeast derivatives in feed additives and ingredients: Sources, characteristics, animal responses, and quantification methods

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<https://doi.org/10.1016/j.anifeedsci.2017.11.010>

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Highlights

- Composition and feeding applications vary among yeast-containing feed additives and ingredients.
- Yeast is a high quality nutrient source and yeast cell wall components may improve animal health and growth performance.
- Standardized methods are needed to accurately quantify components

of yeast cell walls in yeast-containing feed additives and feed ingredients.

Abstract

Numerous yeast products and yeast-containing feed ingredients are commercially produced, marketed, and used extensively in animal feeds around the world. Considerable research has been conducted to evaluate the potential animal growth performance and health benefits of adding yeast, yeast-derivatives, and yeast-containing ingredients into animal feeds. Active dry yeasts are commonly used solely or in combination with beneficial bacteria in probiotic products. Nutritional yeasts are used as supplements in animal feeds due to their relatively high protein and amino acid, energy, and micronutrient content compared with common feed grains and oilseed meals. Other important yeast-based products contain nutraceutical compounds present in yeast cells and cell walls (i.e. β -glucans, mannanoligosaccharides, nucleotides) that have generally been shown to improve animal growth performance and health. Specialty yeast products, such as selenium yeast (highly concentrated and bioavailable source of selenium) and *Phaffia rhodozyma* yeast (contains pigment that improves flesh color in salmon and trout) have specific applications in some animal feeds. Ethanol co-products such as corn distillers dried grains with solubles (DDGS) and new grains distillers dried yeast ingredients, containing more than 40% crude protein, also contain significant amounts of yeast cell and nutraceutical components. Therefore, because these yeast-based products have several nutritional and health benefits, they are becoming alternative supplements in animal feed due to restrictions on antimicrobial growth promoter use in many countries. However, it is difficult for nutritionists to differentiate the characteristics, composition, and optimal feeding applications among the diverse number of yeast-containing products available. Furthermore, most of these products contain combinations of probiotics and nutraceutical compounds with different modes of action, making it difficult to determine which compounds contribute to specific responses observed. Quantification of these nutraceutical compounds is difficult, and except for methods to determine viable yeast in dried active yeast products, there are no standard methods for determining dead yeast concentration or fast, inexpensive, and accurate methods to estimate the proportion of yeast components in various yeast-containing additives and feed ingredients. Due to the increasing popularity of using yeast-based products in animal feeds, development of analytical approaches to estimate yeast and its

products in animal feeds, development of analytical approaches to estimate yeast and its components in these products is greatly needed. In this review, various categories of commercially available yeast and yeast-containing additives and feed ingredients will be described along with our current knowledge about their role in improving animal growth performance, health, and proposed mechanisms of action, and challenges of quantifying yeast content and their biologically active components.



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Abbreviations

AAFCO, Association of American Feed Control Officials; ADG, average daily gain; ADFI, average daily feed intake; CFU, colony forming units; DDGS, distillers dried grains with solubles; DFM, direct fed microbial; DNA, deoxyribonucleic acid; EPA, Environmental Protection Agency; IFN, international feed names; MOS, mannanoligosaccharides; N/A, not applicable; RNA, ribonucleic acid

Keywords

Yeast; Feed additives; Distillers co-products; Immune responses; Growth performance; Analytical methods

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Plasma concentration of glucosamine and chondroitin sulfate in horses following an oral dose, chorus, in the first approximation, evaluates media, regardless of the cost.

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