Benefits of Application of *Saccharomyces cerevisiae* subsp. *boulardii* in Livestock

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**Introduction**

Bacterial infections are an important problem for both animal health and productivity. Traditionally, antibiotics were used subtherapeutically to reduce the impact of bacterial infections in livestock. However, there are increasing consumer concerns about drug residues in meat products and the rise of antibiotic resistance of pathogenic bacteria (Gadde *et al*., 2017). As a result, many countries banned the use of antibiotics in animal diets as a routine means of growth promotion. Thus, there is an increasing demand for alternatives to antibiotics. There is strong evidence that administration of probiotics is effective in the prevention and treatment of acute infectious gastrointestinal diseases. Probiotics are also able to enhance the immune function (Gill & Guarner, 2004).

*Saccharomyces cerevisiae* subsp. *boulardii* (*S. boulardii*) is a yeast probiotic that has also been shown in multiple clinical trials to benefit human health and is safe for ingestion (McFarland & Bernasconi, 1993). It is used as both a preventive and therapeutic agent for the treatment of diarrhea and other GI disorders caused by microbial pathogens such as *Salmonella*, *E. coli*, and *Shigella*.}

**Abstract:** The well-known immune modulating effects of *Saccharomyces cerevisiae* subsp. *boulardii* in humans have also been demonstrated in animals. Dietary supplementation with the probiotic *S. boulardii* improves animal productivity with respect to growth rate, feed intake and feed conversion ratio. Moreover, they result in a reduction of bacterial infections and a protection against the negative effects of pathogens and toxins on gut and health functions. Overall, *S. boulardii* provides a valuable tool to the livestock producer as an alternative to antibiotics.

**Keywords:** Yeast, Probiotics, *Saccharomyces cerevisiae* subsp. *boulardii*, Calves, Piglets, Poultry, Antibiotic replacement

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**Ohly Application Note**

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E. coli, Vibrio cholera and Clostridium difficile (Czerucka et al., 2007).

In the last decade, there has been mounting evidence showing the beneficial effects of S. boulardii also in animals with respect to their health status, growth and production performance (Chaucheyras-Durand & Durand, 2010; Dhama et al., 2011). The safety and efficacy of using S. boulardii in animals have also been established by the European Food Safety Authority (EFSA Panel on additives and products or substances used in animal feed, 2016; 2017a; 2017b).

**S. boulardii enhances the health and immunity of poultry**

Recently, the use of probiotic cultures in the poultry industry has become more customary to improve their health and productivity (Dhama et al., 2011). S. boulardii treatment is effective in diminishing Campylobacter and Salmonella colonization in poultry (USP 6,010,695). Moreover, S. boulardii supplementation reduced carcass contamination with pathogens such as Salmonella, leading to higher quality poultry products (EFSA Panel on additives and products or substances used in animal feed, 2016; 2017a; 2017b).

S. boulardii has also been reported to enhance the resistance of birds against parasitic diseases such as coccidiosis by enhancing the humoral (adaptive) immunity (Lee et al., 2007). The adverse effects of ochratoxicosis (caused by mycotoxins) on broilers were reversed when S. boulardii was ingested, indicating poor absorption of the toxin by the body (Agawane & Lonkar, 2004). This evidence suggests that S. boulardii can suppress the effects of toxic metabolites (Stanley et al., 1993) and can decrease the concentration of bacteria that produce toxins (Radecki et al., 1992).

**S. boulardii improves growth, gut function & health status of piglets**

Piglets undergo a stress-related growth period at weaning, associated with diarrhea and intestinal infections (Bontempo et al., 2006). As an alternative to antibiotics, probiotics such as S. boulardii are able to manage piglet health during this phase. Supplementation with S. boulardii in weanling piglets resulted in greater live weight and greater post-weaning daily gain by up to 40%, as well as improved feed to gain ratio and higher feed digestibility (Bontempo et al., 2006; Collier et al., 2011; EFSA Panel on additives and products or substances used in animal feed, 2017b; Giang et al., 2012). Additionally, weaned piglets fed S. boulardii had a healthier intestine that was more resistant to infections, indicated by lower incidence of diarrhea (Bontempo et al., 2006; Giang et al., 2012).

S. boulardii-treated piglets also had 20% reduced mortality rates against E. coli challenge, associated with an increase in immune cells (Collier et al., 2011). In pigs challenged with Salmonella, S. boulardii enhanced growth versus a diet devoid of antimicrobials (Barker et al., 2003).

S. boulardii was demonstrated to protect the gut against intestinal pathogens such as E. coli and Salmonella by inhibiting the binding of the pathogen to the intestinal epithelial cells (Badia et al., 2012a; 2012b).

**S. boulardii provides health benefits for newly received or weaning calves**

Three of the most stressful events encountered by a calf are weaning, transportation, and arrival at the feedlot facility. These events lead to low feed and water intake for several days by the calves, affecting their health and performance (Arthington et al., 2008).

Addition of S. boulardii to the diet of newly received cattle resulted in lower incidence of Bovine Respiratory Diseases, leading to fewer antibiotic treatments (Keyser, 2006; Buntyn et al., 2016).

Moreover, S. boulardii supplementation to weaning calves increased the amount of beneficial microbiota (lactobacilli) which...
prevents the growth of infective organisms. It also improved colon morphology indicating an early maturation of the gut, reducing the impacts of pathogens (Fomenky et al., 2017)

References


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