# Pediatric Atopic Dermatitis

## New research confirms benefits of probiotic therapy

**Atopic dermatitis**, as defined by the World Allergy Organization (WAO), is a chronically relapsing, non-contagious, inflammatory skin disease. Also known as eczema, atopic dermatitis (AD) comes and goes periodically throughout an individual's life with symptoms of ranging severity. AD is linked to a complex interaction between skin barrier dysfunction and environmental factors such as irritants, microbes, and allergens.[1] Approximately 20% of children are affected by eczema and 8% by food allergy.[2,3] In recent decades, there has been a marked rise in the prevalence of both.[2] Indeed, the simultaneous rise in these conditions may be related, as children with AD are thought to be more susceptible to food allergic sensitization due to the presence of an altered and inflamed skin barrier.[4]

The rapid increase in the prevalence of allergic diseases and the associated burden requires the development of new strategies for effective prevention, diagnosis, and treatment. Healthy intestinal microbiota and their metabolites, specifically **short-chain fatty acids** such as butyrate, play a positive role in the maturation and modulation of the immune response.[5]

Over the last two decades, numerous clinical trials have demonstrated the therapeutic benefits of *Lacticaseibacillus rhamnosus* GG and *Bifidobacterium animalis subsp. lactis* BB-12® for pediatric AD.

In 2000, Isolauri, et al., conducted the first clinical trial to illustrate the potential of probiotic therapy to improve AD symptoms with their inclusion of these strains in extensively hydrolyzed infant formula.[6]

Isolauri and colleagues, Kalliomaki, et al., went on to study *L. rhamnosus* GG and its benefits in additional clinical trials.[4,7,8] In their randomized placebo-controlled trial (RCT) published in the Lancet in 2001, *L. rhamnosus* GG was given prenatally to mothers who met high risk criteria for allergy followed by postnatal administration to their infants. The frequency of AD in the probiotic group was half that of the placebo group. The babies were then followed for seven years, and the results consistently showed a reduction in incidence of eczema. (Figure 1)

Similar preventive benefits were exhibited in a 2019 RCT using a combination of *L. rhamnosus* GG and *B. lactis* BB-12® in late infancy (mean age of 10 months).[9] In this 6 month trial with 290 infants, the probiotic intervention reduced the risk of developing eczema by 63%. (Figure 2)

More recently, *L. rhamnosus* GG elicited therapeutic effects in children with atopic dermatitis in a double-blinded RCT published in Pediatric Allergy and Immunology (2022).[10] In this study, researchers randomized 91 children ages 6-36 months to receive either placebo or *L. rhamnosus* GG at $10^{10}$ CFU for 12-weeks. The primary outcome was treatment on AD severity as measured by a minimum clinically important difference (MCID) of ≥8.7 point reduction on the Scoring Atopic Dermatitis (SCORAD) index. A clinically significant MCID and beneficial modulation of the microbiome was observed only in children who received the *L. rhamnosus* GG. The rate of children achieving MCID under protocol analysis was 0.24 (95% CI: 0.11 to 0.37) for placebo vs. 0.63 (95% CI: 0.48 to 0.77; p<.05) for the probiotic intervention. (Figure 3)

More than two decades of clinical research supports the potential of evidence-based probiotic strains, such as *L. rhamnosus* GG and *B. lactis* BB-12® to provide a microbiome modulation strategy for addressing the challenge of atopic dermatitis among pediatric patients.

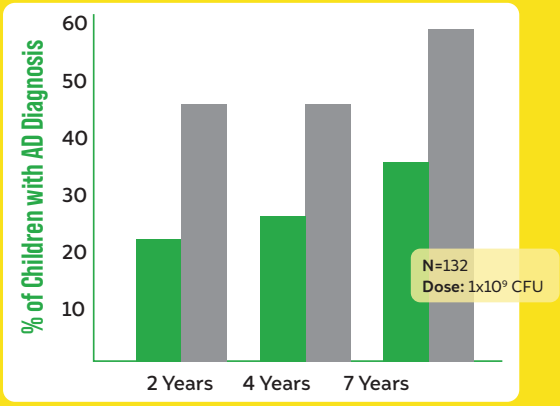


**Figure 1:** *L. rhamnosus* GG reduces incidence of AD in high risk children.

Kalliomaki, et al., 2001, 2003, 2007[4,7,8]

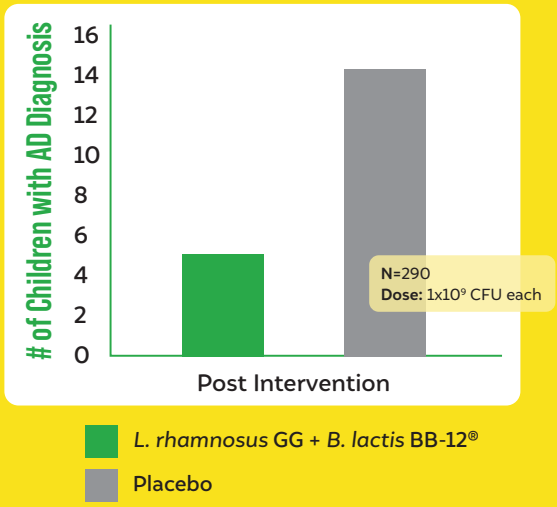


**Figure 2:** *L. rhamnosus* GG and *B. lactis* BB-12® combination reduces incidence of AD in infants.

Schmidt, RM, et al., 2019[9]

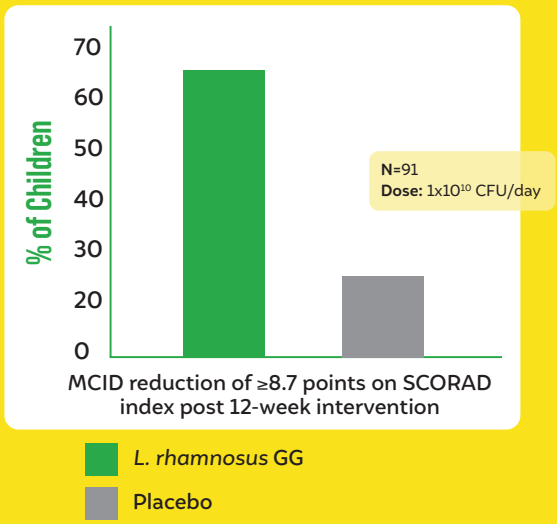


**Figure 3:** Therapeutic effects elicted by *L. rhamnosus* GG in children with AD.

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