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Title: An increased diversity of food introduced in the first year of life as a protective factor for allergic diseases

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Body: Background Dietary factors might play a role in the development of allergies. However the association between infant feeding practices and allergic diseases remains unclear. Previously, we reported a protective effect of an increased diversity of food introduced in the first year of life on atopic dermatitis. We extended the study to determine whether the introduction of complementary food in the first year of life is associated with asthma, allergic rhinitis, food allergy or atopic sensitization. We further analyzed the association between the food diversity and gene expression of markers for T cells and for antibody isotype switching to IgE. Methods 856 children who participated in PASTURE birth cohort study were included. Feeding practices were reported by parents in monthly diaries during the first year. Data on environmental factors and allergic diseases were collected by questionnaires up to 6 years. Results An increased diversity of complementary food introduced in the first year of life was inversely associated with asthma, with a dose-response effect, after adjustment for atopic dermatitis and other potential confounders (adjusted odds ratio for asthma with each additional food items introduced, 0.73; 95%CI, 0.60- 0.88). Similar tendency was observed for food allergy and food sensitization. Reduced food diversity was significantly associated with a decreased expression of Foxp3 and an increased expression of Cε germ-line transcripts at 6 years of age. Conclusion An increased diversity of food in infant's diet might have a protective effect on asthma, food allergy and food sensitization and is associated with an increased level of marker for T regulatory cells.