Food allergy is an adverse reaction to otherwise harmless proteins in food. The disease is a major health problem of growing concern, affecting approximately 5-8% of young children and 2-4% of adults. No accepted strategy exists for prevention and treatment of food allergy, and strict avoidance of the offending food is presently the only viable management option. Living with food avoidance may have a huge impact on the quality of life of food allergic patients, with daily fear of serious or even fatal reactions. The urgent need for safe and efficient food allergy treatment options has led to massive research efforts to develop and improve strategies for food allergy immunotherapeutic approaches. A first step in developing new and improved strategies of immunotherapy often involves the use of animal models. In present review, we provide an overview of animal studies of allergen-specific immunotherapy highlighting opportunities and challenges for each approach. The presented models, almost exclusively performed in mice, assess therapeutic efficacy and immunological outcomes following oral, intraperitoneal, subcutaneous, epicutaneous, and sublingual administration of native allergens, or preparations of hydrolyzed allergen, T cell directed peptides, or allergen with immunomodulatory adjuvants. Recently, approaches using immune cell therapy have demonstrated efficacy. Current models mainly assess anaphylaxis as the primary clinical outcome. With the increased appreciation that food allergy is a heterogeneous disease presenting different phenotypes, there is a continued need to develop new disease-relevant therapeutic models of food allergy.