Atopic eczema (AE) is a chronic relapsing inflammatory skin disorder with increasing prevalence in Western societies. Even though we have made considerable progress in understanding the cellular and molecular nature of cutaneous inflammation, the precise pathomechanisms of AE still remain elusive. Experimental animal models are indispensable tools to study the pathogenic mechanisms and to test novel therapeutic approaches in vivo. For AE a considerable number of mouse models have been proposed and have been used to study specific aspects of the disease, such as genetics, skin barrier defects, immune deviations, bacteria–host interactions or the role of cytokines or chemokines in the inflammatory process. While some models closely resemble human AE, others appear to reflect only specific aspects of the disease. Here we review the currently available mouse models of AE in light of the novel World Allergy Organization classification of eczematous skin diseases and evaluate them according to their clinical, histopathological and immunological findings. The pathogenetic analogies between mice and men will be discussed.