It is widely believed that most of the endothermic animals, i.e. those that produce heat as a byproduct of metabolic processes, are warm-blooded thus maintain high and constant body temperature (T_b). In reality many mammals and birds are heterothermic, and are able to temporarily reduce metabolic rate and T_b. Thanks to this strategy, they are able to reduce negative consequences of unfavorable environmental conditions, such as food shortage or low temperatures. Even within a single population of the yellow-necked mouse *Apodemus flavicollis* there are present a “warm-blooded” and a “cold-blooded” individuals, or those that cannot be assigned to any of these categories as they show an intermediate strategy. Thus the variability of thermoregulatory strategies can be treated as a continuous trait, reaching from the individuals always maintaining high and stable body temperature (thermal specialists) to the individuals periodically operating at lower T_b (thermal generalists). The model assumes that generalists are able to function in a larger T_b range, but when they are in the thermal optimum (i.e. in the conditions when the body is functioning the best), their performance is generally lower than specialists which operate on narrower T_b range. Specialists are able to process energy faster, which can be beneficial, e.g. during reproduction, but they need continuous energy supplies. Generalists are able to save energy, but do not process it as efficiently as specialists. This suggests that both strategies base on maximizing other fitness components - reproduction or survival. In consequence, it leads to the evolution of extremely different life-histories. Investment in rapid and intensive reproduction is associated with greater mortality and shorter life-span, whereas investment in survival strategies can delay reproduction, but is leading to the evolution of longevity. Therefore, we hypothesize that the existence of specialists and generalists in terms of thermoregulation within a single population is maintained by the evolutionary compromise between survival and reproduction. The high variability of thermoregulation strategies persistent in the mouse population is most likely related to the unpredictable food resource and weather conditions. After years characterized by a high seed production, the population of yellow-necked mice increases, while when the amount of food is limited, it drastically decreases. Thus it seems, that variable selection pressure on the ability to save energy under limited resources and investments into reproduction in years when food is available, determines the fitness of individuals using different life-history strategies. Since the frequency and intensity of deciduous tree seed fall is predicted to change as a result of global warming, our research would contribute to a better understanding of the future changes in the populations of wild animals, and therefore in the entire forest ecosystems.