

Bats can be found in almost all climatic zones. They have to deal with unfavorable conditions of environment to survive and reproduce successfully. Especially in temperate zones they have to deal with cold temperatures and lack of food during a winter season. To save energy bats enter a short, diurnal torpor or a hibernation. Usually, hibernation lasts all winter and is disturbed by short bouts of arousals. During both hibernation and torpor a physiological changes occur in bodies of bats. Body temperature decreases from endothermic levels, metabolic rates are reduced as well as respiratory rate and pulse. These changes are mainly influenced by weight and body size, diet, ambient temperature, sex and reproductive status. With the development of new technologies, these changes can be measured more accurately than they have been in past, whether in a field or in a laboratory. But not all physiological processes are well explained. We have little knowledge especially about mechanism of arousal from hibernation. During awakening bats are infected by fungus *Geomyces destructans* that affects their immune system. In North America fungus causes a disease called White- Nose syndrome (WNS), that is responsible for death of millions of bats, especially endangered is *Myotis lucifugus*. In Europe, this disease is referred to as *Geomykóza* and no massive mortality has been observed.