Many organisms living in seasonal environments use annual changes in the length of the day for timing of their responses, such as reproduction, migration or hibernation. Hibernation allows animals to survive difficult periods associated particularly with cold temperatures and lack of food resources. This adaptation requires many physiological, morphological and behavioral changes. Some of these changes take longer, so their right timing is crucial. For most hibernators in temperate regions shortening of the photoperiod is the most reliable signal for initiation of these changes. This work describes the transduction of photoperiodic information to the melatonin signal, its effects in the pars tuberalis and the significance of this structure in seasonal physiology. A more detailed description is devoted to hibernation, and in the last chapter there is briefly mentioned photoperiodism in nonhibernating organisms.