The thesis focuses on the study of properties of exotic hypernuclei, particularly of beryllium, carbon, oxygen and neon isotopes with and hyperons. Calculations were performed in the framework of the relativistic mean field theory (RMF) where a (hyper)nucleus is treated as a system of Dirac spinors (nucleons, hyperons) interacting via (mean) meson fields. The exotic hypernuclei were considered as axial symmetric. Up to now, hypernuclear calculations have been performed under assumption of spherical symmetry. This work thus extends hypernuclear calculations to the region of exotic, generally deformed systems. For the above nuclei, the numerical calculations of the binding energies and root mean square radii were performed. Moreover, we studied influence of the tensor interaction between meson and hyperon on the spin-orbit splitting. The results confirmed that the presence of the hyperon increases values of the binding energy of a system and on the contrary, it decreases its root mean square radius. We studied the possibility of the existence of the hyperon bound states in a nucleus. For the above isotopes, no bound states were found for the + hyperons. On the other hand, weekly bound states of the – hyperon are predicted for several isotopes.