Double-differential cross sections (d$^{2}$\sigma/dQd$\epsilon$) have been calculated and analyzed for triton production in proton-induced reactions on $^{27}$Al, $^{54,56}$Fe, $^{197}$Au, and $^{208}$Pb target nuclei at incident energy of 62 MeV. Calculations of double-differential cross sections have been performed using nuclear models implemented in the TALYS 1.2 code. The calculated results of the double-differential cross sections for triton emission have been compared with the existing experimental data.