The elastic and magnetic properties of the epitaxially grown \( \text{Al}_2\text{O}_3/\text{Mo}(20\text{nm})/\text{Co}(d)/\text{Au} \) systems, with \( d=1.2, 10, 31 \) (nm), have been investigated by Brillouin light scattering (BLS) from generalized Rayleigh’s elastic waves (phonons) and Damon-Eshbach spin-surface modes (magnons). For magnetic-type experiments perpendicular uniaxial anisotropy and in-plane two-fold anisotropy contributions to the energy density were distinguished and the anisotropy constants were determined. The contributions showed tendency to compete mutually. The same tendency was confirmed qualitatively in ferromagnetic resonance (FMR) experiments. For samples with higher uniaxial anisotropies, and lowered in-plane anisotropy contribution, higher BLS-magnon frequencies were observed. Obtained magnetic results were correlated with the measured phonons frequencies. Phonons results were in-plane isotropic and the uniaxial anisotropy contributions affected only the average level of the observed spin-wave frequencies. However, measured phonons frequencies were lower for samples with higher uniaxial anisotropies. Obtained results provide information useful for technology of magnetoelectronic devices.