Lignans are phenolic compounds present in edible plants. Secoisolariciresinol (SECO) is present in flaxseed as a glucoside, secoisolariciresinol diglucoside (SDG), which can be metabolized to the mammalian lignans, enterodiol (ED) and enterolactone (EL) by human intestinal microflora. The flaxseed lignans are known to have a number of potential health benefits, including decreased formation of breast, prostate and colon cancers attributed to (anti)-estrogenic and antioxidant properties. The aim of this study was evaluated the effect of probiotic *Lactobacillus casei* and *acidophilus* on the bioaccessibility of flaxseed lignans using an *in vitro* simulation of digestive process. Flour flaxseed (FF) and whole flaxseed (WF) were subjected to chewing, stomach, small and large intestine. Lignans bioaccessibility was calculated as (free lignan)/(total lignan). No lignans were detected during chewing, stomach, small intestine, except for SDG which was released in the stomach, but only for WF digestion, reaching 0.12% of bioaccessibility. The bioaccessibility of SDG was higher for FF digestion (1.99%), however in the presence of *L. casei* was higher the bioaccessibility for WF digestion (1.42%). For SECO and ED, the bioaccessibility of WF digestion was significantly higher (0.73% and 1.24%, respectively), however the presence of probiotics had no effect. Finally, EL bioaccessibility was significantly higher for FF digestion (2.62%). For WF digestion EL was lower than FF without probiotics, nevertheless in the presence of *L. casei* this decrease was attenuated. Therefore, the probiotics do not increase the release of lignans compared to control, however *L. casei* increase the bioaccessibility of lignans for WF digestion.