Scientists from various disciplines have been studying the fate, impact and transport of estrogens in natural and engineered systems. Emphasis is mostly focused on natural and synthetic estrogens affiliated with humans and animals. It is widely accepted that Wastewater Treatment Plants (WWTPs) and Concentrated Animal Feeding Operations (CAFOs) are the main sources of estrogens in water bodies. Wastewater treatment practice has relied on biodegradation and sorption to biosolids for the removal of estrogens. This has led to partial success in the attenuation of these compounds. The increasing global concern about the presence of estrogens and other pharmaceuticals in water, especially in areas of limited water resources has been the driving force for the development of sustainable solutions for controlling estrogens and chemically related compounds in treatment systems. Recent findings in our laboratory suggest chemically related compounds in treatment systems. Recent findings in our laboratory suggest that abiotic transformations (catalytic or enzymatic) of estrogens involving the phenolic group may present a low-cost alternative for control of these chemicals. We have confirmed in our work that abiotic transformation of estrogens is associated with vegetable-type wastes normally present in WWTPs and CAFOs outputs, but the underlying mechanisms have not been yet completely identified. Using rabbit food as a model vegetable material and 14<SUP>C</SUP>-labelled estrogens, we have attempted to characterize the aforementioned mechanisms under oxic and anoxic conditions. Observed differences in behavior encountered under the two scenarios are substantial and offer added explanation on the fate of estrogens in treatment systems and the important role that abiotic transformations can play. Additionally, comprehension of the fundamentals of the abiotic mechanisms provides the basis for the design of new treatment technologies.