

Trends of fresh green food for lactating roe deer females

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Increasing temperatures, changed precipitation patterns as well as more intense and frequent extreme events will alter the phenology of both flora and fauna and shift species distributions. Moreover, farmers respond to climate change by adapting land use and management, and thus the cultural landscape is changing. Therefore, the health and fitness of wild animals will be largely affected by factors directly and indirectly linked to climate change. Familiar examples of mismatch due to loss of temporal synchrony in food webs are known from birds (timing of migration or egg laying in relation to food resources) and insect pollination (timing of first flights in relation to plant flowering). However, also large herbivory mammals may suffer from climate change induced phenological mismatch if they are not able to “surf on the green wave” any more.

Taking roe deer (*Capreolus capreolus* L.) as key example, we studied changes in the spring phenology of potential food plants during the last four decades in southern Germany. Our analysis is based on the phenological observations of the German Meteorological Service as well as on the comprehensive multi-species dataset of a dedicated citizen scientist. Roe deer is sensitive to slight phenological changes of food plants, since only the first fresh green contains maximal protein contents which are needed by the females to suckle their fawns born mid of May till mid of June.

We find indications for an increasing number of food plant species available in the lactation period, however probably with a decreasing food quality over the decades. Since females have delayed implantation it may be difficult to well synchronise the postnatal period to the vegetation development. A unique dataset of marked fawns suggests that also the timing of birth has slightly advanced in recent decades. We discuss these changes in the match-mismatch of lactation period of roe deer and spring leaf phenology and their driving factors in detail.