

# When to have kids: A complex question for hazel dormice

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Claudia Bieber from the Research Institute of Wildlife Ecology (FIWI) of the University of Veterinary Medicine, Vienna, and fellow scientists analysed a capture-recapture data set on common dormice (*Muscardinus avellanarius*) to investigate the life-history strategy of this species. These small rodents are about the size and weight of a wood mouse (*Apodemus sylvaticus*), but, unlike their rodent cousins, they hibernate – usually from late September/October to April/May. This is reflected in rather different life history strategies: While wood mice may reproduce any time between February and October and have multiple litters in one season, common dormice give birth to young either as early as possible after waking up from hibernation, or as late as possible, just in time to get the young fit for hibernation. The research findings are published in the current issue of the international journal *Oecologia*.

According to life-history theory, a species' reproductive strategy (e.g. time of sexual maturity, first reproduction, litter size, and other factors) is evolutionarily adapted to the environmental constraints encountered by that species in its natural habitat, such as availability of food resources and predictability of the environment. The aim generally is to produce the largest possible number of surviving offspring under particular conditions.

The researchers observed in a wild dormouse population in Lithuania two peaks of reproduction within the active season. About one third of the litters were born early in the year (June), but the majority were born late in the active season (August/September). In mid-summer, however,

only a small fraction of females gave birth to litters, although environmental conditions did not impair investment into reproduction in this time frame. While wood mice, for example, have what is generally known as a "fast" life history, common dormice apparently have some flexibility to adjust their life history tactics (early versus delayed reproduction) to circumstances. Dr. Claudia Bieber and her fellow scientists hypothesized that the ability to hibernate may explain this unusual bimodal birth pattern in the hazel dormouse.

So far relatively little is known about hibernation and survival rates of small hibernators, such as common dormice. By means of a long-term mark and re-capture study, the researchers were able to determine that, unlike previously thought, survival rates were high during the hibernation period for all age-groups. Thus, even animals born late in the active season face a period with high survival probability during the upcoming winter season.

By comparing lifetime reproductive success (the number of juveniles produced in a females' lifetime) the scientists found that the early-born juveniles outpace their late-born counterparts. The May-born cohort often manages to raise their first litter in the same year. In populations under high predation pressure, like the one in Lithuania, this "fast" life history strategy seems to convey an advantage. However, only females that already have a high body-mass in the spring manage to invest into early reproduction – for females with lower body-mass it is better to delay reproduction until late in the active season, which maximises the chances of survival of their young. This is referred to as a "slow" life history strategy. "Most interesting is the fact that we observed "fast" and "slow" life histories occurring within the same population," says Claudia Bieber, lead author of the study. "It turns out that life histories are much more flexible within a species and even within a population than so far expected."

**More information:** The article "High survival during hibernation affects onset and timing of reproduction" by Claudia Bieber, Rimvydas Junkaitis, Christopher Turbill and Thomas Ruf is published in the current issue of the journal *Oecologia*, Volume 169, Number 1 (2012), 155-166, [DOI: 10.1007/s00442-011-2194-7](https://doi.org/10.1007/s00442-011-2194-7)

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