Effects of food supplementation in autumn on subsequent reproductive success

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As food-storing hibernators, common hamsters are limited in the time available for reproduction and preparation for the winter period. The timing of reproduction onset in spring seems to be a crucial factor for the seasonal reproductive output because the earlier a female emerged from the winter burrow in spring and started to reproduce, the more litters and more offspring were produced. Furthermore, we could show in a recent study that experimentally enlarged food stores of high quality before winter can promote an earlier reproductive onset, but if this would also result in an increased reproductive output remained unknown. We, therefore, provided free-ranging female hamsters with additional food (500 g sunflower seeds) shortly before winter and compared their reproductive performance during the following season to unsupplemented females by applying capture-mark-recapture techniques. Supplemented females started above-ground activity later than unsupplemented ones, but the conception date of the first litter and, hence, reproductive onset did not differ between the groups. We found no differences in body mass at spring emergence or first conception between females with or without additional food. The time between emergence and first conception, however, was affected by body mass in unsupplemented females: the heavier these females were at emergence, the earlier they started to reproduce. Such a relationship was not detected in supplemented females, but these individuals showed a stronger body mass increase per day during this time. The seasonal reproductive success differed between the groups as supplemented females produced more litters and more offspring per season compared to unsupplemented ones. These results highlight the importance of food availability in autumn. Sufficient and, particularly, high-quality food stores during the winter period could increase a female's reproductive success in the following season, which could counteract the population decline in this species.