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## Effect of grazing on photosynthetic carbon allocation in a temperate grassland

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Grazing is an important human activity affecting grassland ecosystems. Many studies have shown that grazing changed the carbon (C) cycle of grasslands, but it is still not clear how grazing will affect the recent photosynthetic C allocation in the temperate grasslands. To clarify this question, a situ field <sup>13</sup>C labeling experiment was carried out in the temperate grasslands of Inner Mongolia, North China, in 2015. In this study. Grazing included 3 intensities of no grazing, medium grazing and heavy grazing. Eighty-one days after the labeling, the plants allocated more recent assimilated <sup>13</sup>C (6.52% of recovered <sup>13</sup>C) to shoots under medium grazing than that of no grazing (5.60%) and heavy grazing (5.40%). The most <sup>13</sup>C was allocated to the belowground (roots, soil and soil respiration) under no grazing (40.68%). However, within the belowground pools, 1.36% and 17.33% of <sup>13</sup>C were stored in roots and soil under medium grazing which was twice than that under no grazing and heavy grazing, which could be explained by intermediate disturbance hypothesis. <sup>13</sup>C labeling experiment demonstrated medium grazing increased C assimilates by two processes: (□) the highest total C input into plants and soil and (□)the least C loss by soil microbial respiration (3.20%) than no grazing grassland (5.19%) and heavy grazing grassland (3.47%). The turnover rate of soil assimilates under the no grazing ( $0.25 \pm 0.07 \text{ day}^{-1}$ ) was higher than that of grazing (medium grazing  $0.059 \pm 0.01 \text{ day}^{-1}$ ; heavy grazing  $0.064 \pm 0.02 \text{ day}^{-1}$ ). Overall, the no grazing isn't the best for carbon accumulation and the medium grazing which promotes C input and C sequestration is the most suitable grazing intensity of temperate grassland in China.