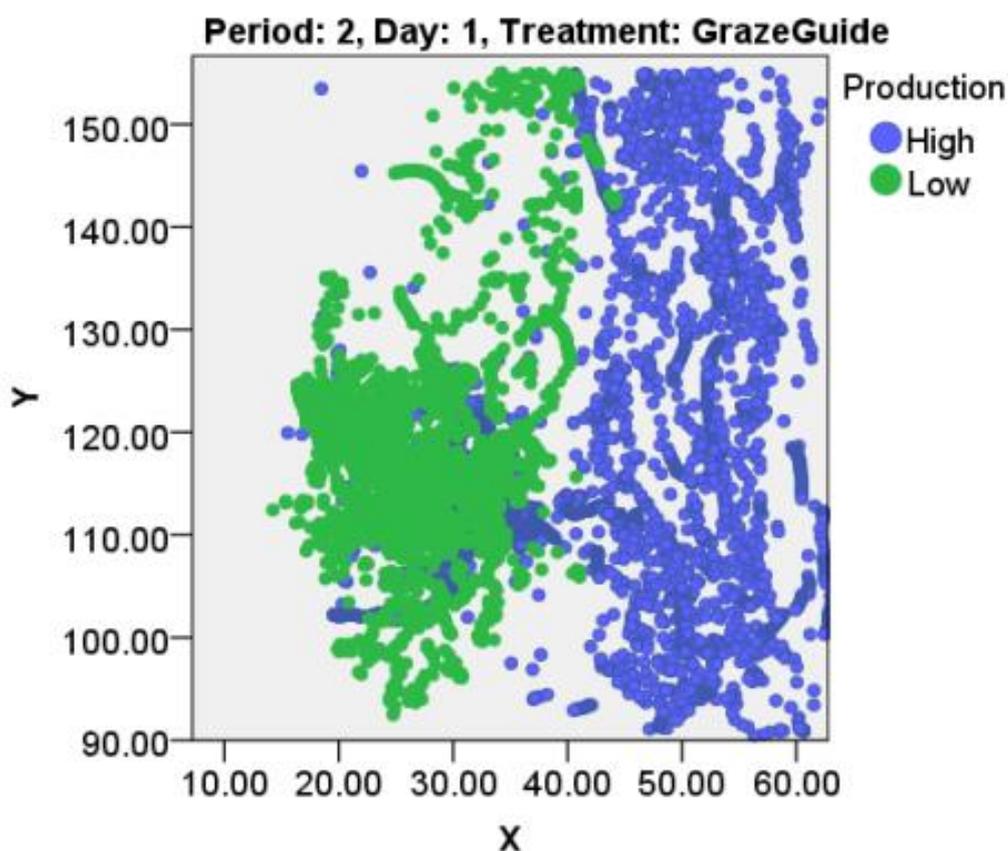


Changes in the Social Network when Separating High- and Low-productive Dairy Cows

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Dairy cows may graze more efficiently when allowed grazing in predefined areas with predictable sward height and grass quality. According to literature separating High- and Low yielding (HY and LY) dairy cows may have advantages for efficient grassland use, by allowing HY-animals to graze on a new grass strip first. In the control group 8 cHY and 8 cLY cows were grazing on a fixed area with every day a new strip of grass. In the experimental group 8 eHY- cows (matched with cHY) were also free to graze in the same fixed area, but 8 eLY cows (matched with cLY) were potentially stopped at a virtual fence and reduced the grazing area with possible social, welfare and production consequences. The virtual fence consisted of underground wires signalling a boundary that was received in the cow collar, producing a warning signal to the cow when approaching the boundary and a correction signal when crossing the boundary. All individual cows' positions were recorded using GPS during day and night in the pasture and their locomotion and nearest neighbour were determined. The cows were moved to a milking parlour twice a day; individual milk production was recorded (liter per day). Data were recorded in three periods, i.e. P1 (learning), P2 (basis) and P3 (cross-over, i.e. experimental and control group were switched). The virtual fence was successful in preventing eLY-cows to reach the fresh grass. A reduction in their locomotion was found that might be related to a reduced welfare. However, no effect of the virtual fence and the restriction of the LY experimental group on milk production was found. Analysis of the Social Network showed a strong separation between eHY- and eLY-cows induced by the virtual fence leading to a new social structure. In the cross-over this social structure initially remained, but extinguished in 3 days.



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