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### **Using GrazeGuide (virtual fencing) separation for grazing in production groups**

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Grazing plays an important role in the societal support for dairy farming. Dairy farmers are looking for tools to increase the efficiency of grazing. According to literature separating High- and Low yielding (HY and LY) dairy cows may have advantages for efficient grassland exploitation, by allowing HY-animals to graze on a fresh grass strip first. With traditional fencing the implementation of this practice is rather complex. Virtual fencing can possibly eliminate the disadvantage of too complex grazing management, because it becomes easier to separate the herd into production groups.

The virtual fence consisted of underground wires used to activate a cow collar, producing a warning (sound) signal when approaching the boundary and a correction (shock) signal when crossing the boundary. The individual cows' positions were continuously recorded with GPS recorders and their locomotion and nearest neighbour were determined. The cows were milked in a milking parlour twice a day (milk production was recorded). Data were recorded in three periods of 3 days, i.e. P1 (learning), P2 (basis) and P3 (cross-over, i.e. experimental and control group were switched). In a preceding project (the Amazing Grazing project), virtual fencing has already been embraced by livestock farmers as one of the innovations to be investigated. In the context of this program, in 2015 the application of virtual fencing in graze management were explored. 8 Heifers demonstrated that they can learn the used signals of the applied virtual fencing system. The follow-up question for 2016 focused on the use of the GrazeGuide system by lactating dairy cows, focusing on the possibility of allowing high-yielding cows to graze on a strip with fresh grass first. In a control group 8 cHY and 8 cLY cows were grazing on a fixed area with every day a new strip with fresh grass. In the experimental group 8 eHY cows (matched with 8 cHY) were also free to graze in an area with the same size and characteristics, the 8 eLY (matched with 8 cLY) cows in the experimental group were effectively stopped with the GrazeGuide, resulting in having only access to a reduced grazing area (no access to the fresh grass part). 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 and or related to the availability of smaller area. 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. In the cross-over this separation initially remained but extinguished within 3 days. Our conclusion is that GrazeGuide allows the use of new more complex grazing methods.