HerdPlanner: model-based tactical decision support for reproduction and culling

Harms Elmer*[1], Kool Robin[1], Hagens Marit[1], Adriaens Ines[1], Sol Marc[1]

[1] CRV BV

Farm size restrictions can be physical (e.g. nr. of cubicles) or environmental (e.g. available space in nitrogen, phosphate or CO2 emissions). Optimal utilization of the available space is needed to maximize profitability, for example by having the right balance between youngstock and milk producing cows. Since there is an almost three year delay between the insemination decision and the start of the resulting heifers' lactation, this is a hard to control process. With 'HerdPlanner' we support the farmer in making decisions to optimize the herd composition within spatial and environmental constraints by guiding individual cow insemination and culling decisions.

In three workshops with in total 29 farmers from across the Netherlands and Flanders, topics such as insemination decisions, voluntary/forced culling and herd composition where discussed. Based on these farmers' feedback, a phased development of the 'HerdPlanner' was formulated. In phase one we focus on advising on inseminations, both at individual and at herd level. Individual insemination advice is based on the (expected) performance, lactation stage, expected dry-off yield, health state and genetic makeup of an animal. The advice varies between 'inseminate', 'wait' or 'do not inseminate'. At a herd level, the advice specifies how much to inseminate with sexed, conventional or beef-on-dairy semen in a 21-day period, in order to achieve the number of heifer calves that are needed to keep the herd on level. HerdPlanner advices are provided to farmers via an experimental module 'AI Lab' in CRV's farm management software. AI Lab collects feedback on both contents and presentation form, such that the tool can quickly be optimized to have maximal value for the farmer. In the second phase we will focus on culling advice based on individual-cow (expected) economic performance.

The tool is evaluated with quantitative and qualitative feedback collected at approximately 50 farms over several months. With HerdPlanner, we provide farmers with valuable decision support for optimizing their herd composition.