Development of a heat-assessment with factors of a cow

L. von Tavel, F. Schmitz-Hsu, U. Witschi and M. Kirchhofer

Swissgenetics, Meielenfeldweg 12, 3052 Zollikofen, Switzerland
Corresponding Author: lvt@swissgenetics.ch

Abstract

A system for a rapid heat-assessment of a cow during insemination was developed based on six factors and an overall score. A field-test with 27 technicians doing 8184 inseminations showed a difference of up to 34.7 %-points in the non-return rate 56 days between score combinations. The proposed system helps considerably to evaluate the cow during the routine insemination process.

Keywords: insemination, heat-assessment, non-return rate

Introduction

The success or failure of an insemination depends mainly on the cow. The heat-assessment of a cow by a technician in the routine process must be done quickly and whenever possible without the need of information from a third party, e.g. the farmer. For this purpose, a simple but effective system is needed to judge the cow in order to predict the success of insemination. We designed a system with which the technician evaluates the relevant data about the cow during the insemination process. The data is recorded using a tablet in the field.

The goal is to collect data in order to derive a more reliable estimate of the bull's non-return rate.

Material and methods

Based on literature (Röthlisberger, 1999; Bühler and Maurer, 2004; Stevenson *et al.*, 1983; Bhat and Bhattacharyya, 2012; Rutten *et al.*, 2016), a set of six factors was chosen to assess the status of the cow and was evaluated in a field test.

- Position of the vulva.
- Quantity of mucus.
- Uterus tonus.
- Size of the uterus.
- Cervix passage.
- Insemination timepoint.

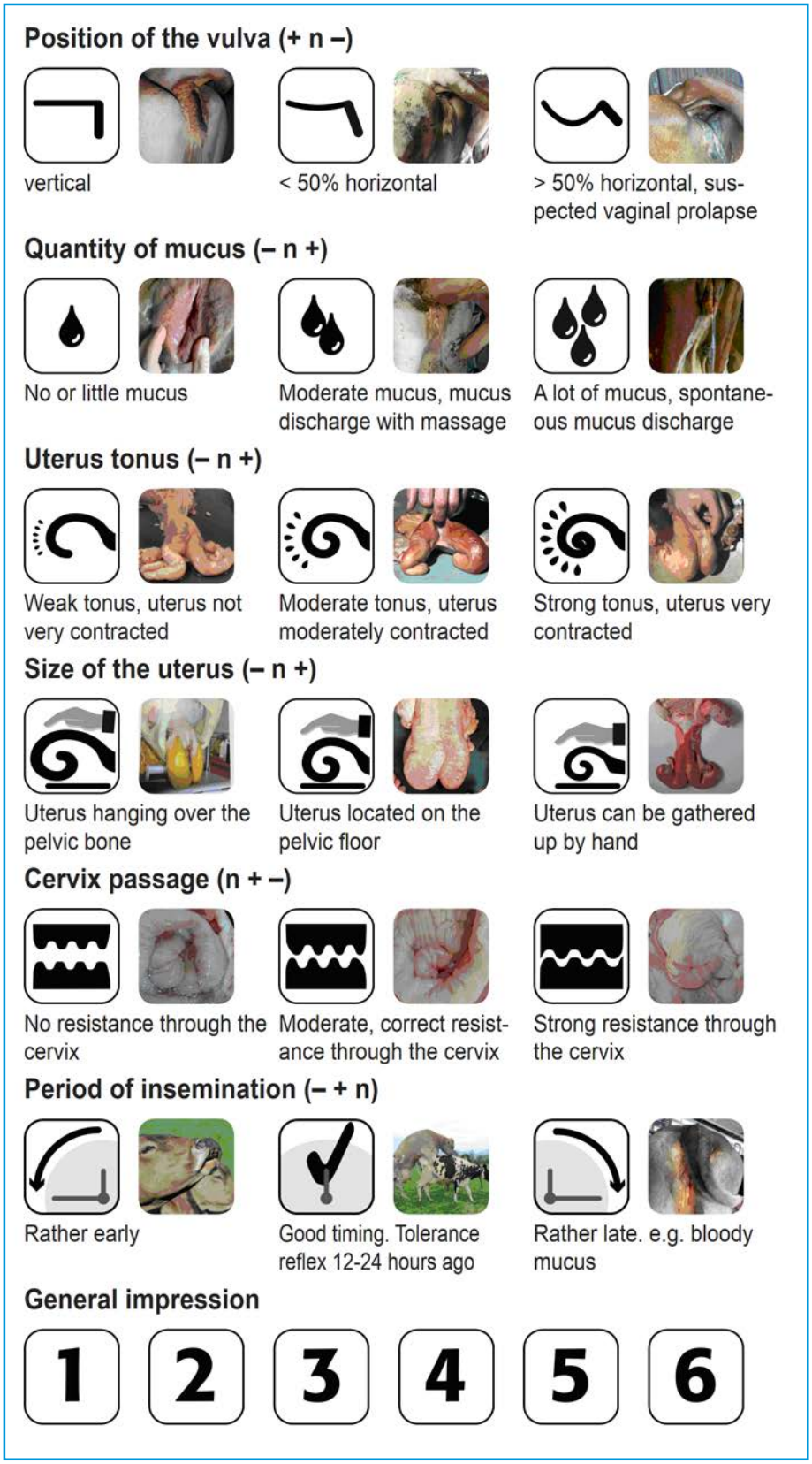

Figure 1. Pictograms and explanatory photos of the heat-assessment system.

These six factors of the cow are scored with three levels each:

+ for good/positive

n for neutral

- for bad/negative.

To simplify data entry and to increase the tangibility for the technician, only pictograms are shown on his tablet. Additionally, the technician is asked to enter a score from 1 to 6 indicating his personal prediction of the probability of success of the insemination. Figure 1 shows definitions and pictograms of the scores plus explanatory photos of the assessment system.

In a field-test for two months, 8184 inseminations done by 27 technicians were evaluated. The heat-assessment was compared with the non-return rate 56 days.

Results

The 27 technicians involved in the field-test accepted the heat-assessment system well after a short training. They used the full range of the scores.

The evaluation of the combination of factors - occurring at least 100 times - showed that the proposed heat-assessment scores are positively associated with the probability of success of the insemination. There was a difference of 34.7 %-points in the NR56 between the inseminations with the best level of all factors and those with the worst level of all factors.

The personal prediction of the technician (1 - 6) at the time of insemination was consistent with the NR56.

Compared to the previous heat-assessment system, the new approach allows a much more differentiated prediction of the success of insemination.

Conclusion

The proposed system helps considerably to evaluate the cow during the routine insemination process. The obtained data also improves the evaluation quality of the bull's NR56, which is essential for AI organisations in terms of quality control of semen straws released to the market.

Swissgenetics introduces the heat-assessment system nationwide (240 technicians) in June 2019.

List of references

Bhat, F.A. and H.K. Bhattacharyya. 2012. Oestrus duration and status of reproductive organs in repeat breeding cows. Iranian J. Appl. Animal Sci. 2:295-299.

Bühler A. and R. Maurer. 2004. Einfluss ausgewählter Exterieurmerkmale auf die Fruchtbarkeit beim Milchvieh. Diploma thesis School of Agricultural, Forest and Food Sciences HAFL, Zollikofen.

Röthlisberger, J. 1999. Zusammenhänge zwischen Befunden anlässlich der Besamung und dem Besamungserfolg bei der Kuh. Doctoral dissertation University of Bern.

Rutten C. J, W. Steeneveld, J.C.M. Vernooij, K. Huijps, M. Nielen, H. Hogeveen. 2016. A prognostic model to predict the success of artificial insemination in dairy cows based on readily available data. J. Dairy Sci. 99: 6764-6779.

Stevenson, J. S., M.K. Schmidt, E.P. Call. 1983. Factors affecting reproductive performance of dairy cows first inseminated after five weeks postpartum. J. Dairy Sci. 66:1148-1154.