

Standardized comparative analysis of the reproductive performance in large commercial Hungarian dairy herds



László Ózsvári^{1*}, Ferenc Kranjec², István Fodor¹

¹ Department of Veterinary Forensics, Law and Economics, University of Veterinary Medicine Budapest, H-1078 Budapest, István u. 2., Hungary

² ReproVET Ltd., H-1171 Budapest, Zrínyi u. 224., Hungary

*E-mail: ozsvari.laszlo@univet.hu

Objectives

Profitability is fundamentally influenced by the reproductive performance in the dairy herds. The evaluation of reproductive performance varies greatly among the dairy farms in Hungary, but many conventional reproductive indices are widely used, such as productivity, calving interval (CI), services per conception (SPC) and the percentage of pregnant cows (PP), at the same time the heat detection rate (HDR), the conception rate (CR) and the pregnancy rate (PR) are quite rarely applied. The aim of this survey was to assess the average values of the most commonly used reproductive indices in the Hungarian dairies, to introduce more powerful, novel reproductive parameters and to examine their practical applicability.

Materials and methods

The authors surveyed the major reproductive indices on 21 large commercial dairy farms from six Hungarian counties between February and May 2015. Altogether the individual data of 12,723 cows were collected from the farm management software RISKÁ (Systo Ltd., Hungary). Associations between the major reproductive parameters were analysed by Spearman's rank correlation. Data were managed in Microsoft Excel 2013 (Microsoft Corporation, Redmond, WA, USA). Statistical analyses were performed in R version 3.4.0. (R Core Team, 2016).

Results

The major production and reproduction parameters of the surveyed herds are shown in **Table**.

Average values of the conventional reproductive indices were: calving-to-conception interval (CCI) – 160.1 days, services per conception (SPC) – 4.3 and first service conception rate (CR1) – 22.3%. The CCI, SPC and CR1 were much poorer than the former reference values even in the best herds.

Acknowledgements

The Project is supported by the European Union and co-financed by the European Social Fund (grant agreement no. EFOP-3.6.2-16-2017-00012, project title: Development of a product chain model for functional, healthy and safe foods from farm to fork based on a thematic research network).

It was proven that pregnancy rate (PR) and the corrected pregnancy rate (cPR – pregnancy rate within 200 DIM) are applicable in Hungarian dairy farms due to their strong correlation ($p < 0.05$) with other reproductive parameters (CCI, SPC, CR1, PP, productivity, calving-to-conception interval within 200 DIM [CCI200], percentage pregnant within 200 DIM [%P200], open cows beyond 285 DIM [O285]), therefore these parameters are advised for routine use in dairies. In this study corrected pregnancy rate (cPR) was introduced as a novel parameter that is destined for overcoming inaccuracies stemming from Hungarian culling policy. In the surveyed herds PR was 9.6% and cPR was 17.3%, on average.

Table. Production and reproductive parameters of the herds (n=21)

Parameter	Average	Minimum	Maximum
Number of cows	606	169	1,269
Lactational milk yield (kg)	9,851	8,000	12,174
CCI (days)	160.1	125.0	205.0
SPC	4.3	3.2	7.2
CR1 (%)	22.3	14.0	36.0
PP	43.0	28.8	60.5
Productivity (%)	64.2	52.5	78.5
CCI200 (days)	108.6	95.0	121.0
%P200	71.7	56.0	86.0
O285 (%)	2.7	0.0	7.8
PR (%)	9.6	4.4	16.0
cPR (%)	17.3	10.3	26.4

Conclusions

PR and cPR should be brought to the fore instead of productivity, since these parameters better reflect the reproductive performance of the herd. SPC should not be overemphasized, because it is much less relevant from an economic point of view, e.g. compared to CCI. Reproductive performance must always be evaluated taking several indices into account. The use of some relevant parameters (PR, cPR, CR1, CCI) is enough for the daily routine, but in-depth analysis is required when the reproductive performance is diminishing.