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Working Times and Milking Capacity in Swingover Parlours

Time consumption for milking routines were recorded on 26 farms (Germany and GB) with swingover parlours (n = 20; 14 to 52 places) and in standard herringbone parlours (n = 6; only GB). As long as the milkers followed the same routines, no difference in the capacities of the two systems could be observed. The throughput in GB with bigger installations was 91 cows per hour (standard herringbone) and 98 cows per hours in swingover parlours, whereas in Germany it was 61 cows per hour, due to a different routine.

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Swingover parlour, working time

Knowledge of the relevant parameters of performance (time consumption for milking the cows, for preparing / finishing the milking procedure; capacity (cows/h)) is a precondition for assessing milking installations. So the aim of the present study is to get more knowledge about the efficiency of swingover-parlours (milking parlours with one milking unit [MU] per pair of places), about the respective working routines and to compare these with similar „standard" parlours (one MU per place).

Recording of data

Relevant data was recorded in 13 bigger herds with modern swingover-parlours and in six „standard"-parlours in Great Britain. The size of the herds was between 66 and 253 dairy cows. Additionally measures were taken in seven swingover-parlours (43 to 90 cows) in Northern Germany. The cows in all British parlours (swingover and „standard") stood in an angle of 50° and were milked through the hind legs. The size of the parlours varied from 2•7 to 2•16 (32 MU/32 stalls) in „standard"-parlours and 2•26 (26 MU/52 stalls) in swingover-parlours. It was important that these parlours were operated by one milker only.

One observer (first author) recorded the length of the work routines during one to two milkings with at least 43 (max. 253) cows. The single routine tasks during milking were grouped for better recognising interactions between tasks and to find possibilities for optimisation:
* *work on an individual cow* (∑ individual cow) prepare udder, attach cluster, strip, take off cluster, dip teats, miscellaneous (mostly: clusters kicked off)
* work on a group of cows (∑ group) walk, let in cows, let out cows, feeding concentrates, work in collecting yard, misc.
* work on the system (∑ system) clean units, clean parlour (during milking), other organising
* idle time (the milker is waiting for the next task to perform)

It is known from earlier investigations [1] that the parameters of milkability and times needed to perform (especially short) work routines do not show a Normal Distribution. The same is true for calculated quotients, e.g. for performance. Accordingly it is not feasible to draw direct conclusions from arithmetic means of work routine times to the performance of an installation. So in this paper all means are calculated as „geometric means," performance data calculated from these geometric means are plausible (*Tab. 1*).

Results and discussion

The results of our observations show that in GB working routine times (WRT) per cow and the resulting performances are very similar, independent of the type of installation. In Germany the milkers are working longer, however, especially for preparation of udders and for stripping, producing obvious differences between GB and BRD performances. Additionally the idle times in BRD are longer, indicating too small (!) installations. According to these findings, only results from GB installations will be used for more detailed analysis of work routine time (WRT) and performances. Time consumption for ∑ group and ∑ system is equal in both types of installation as these routines do not depend on the organisation of the WRT for milking.

The performance of the milkers is shown in *figures 1 and 2*, describing its dependen-

Table 1: Working time [cmin] per cow in the parlours; geometric means

trait	D* GB	SO** GB	SO** D	Sign.
n of farms	6	13	7	
udder preparation	2.4	1.3	14.1	***
strippings	0.7	0.8	7.2	*
collecting yard	2.3	1.7	5.0	*
idle time/cow	3.8	2.2	11.8	-
total time/cow	66.3	61.5	98.0	*
∑ individual cow	31.2	28.7	48.2	**
∑ group	22.0	21.6	29.6	-
∑ system	5.1	4.2	5.0	-
cows/h	90.5	97,5	61.2	(7%)
cows/place and h	4.4	3.1	2.9	***
cows/unit and h	4.4	6.3	5.9	***

D*: double parlour
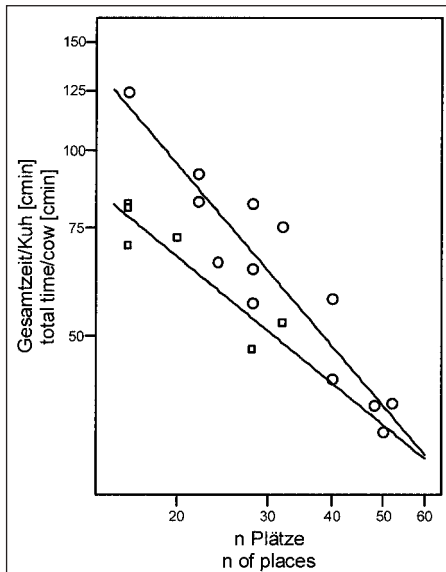SO**: Swingover-parlour

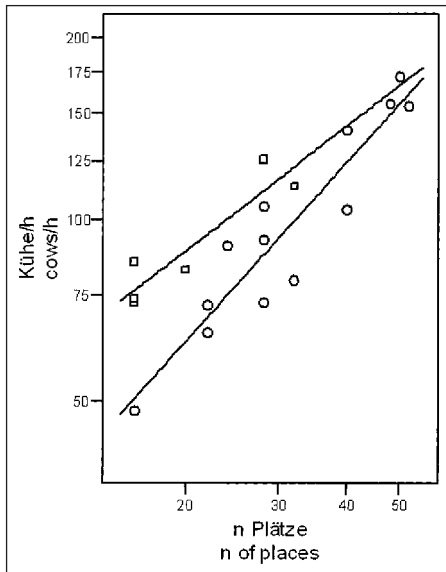Fig. 1: Total working time per cow correlated with n of places, only GB-parlours

Fig. 2: Throughput per h correlated with n of places, only GB-parlours

Fig. 3: Use of milking places per h in different parlour types; only GB parlours

Fig. 4: Use of milking units per h in different parlour types; only GB parlours

the milkers adapt their WRT to the number of cows in a milking group. In big installations WRT will be reduced to minimal udder preparation and unit attachment, independent of the type of installation.

An additional important fact is the utilisation of the milking places. We found considerable differences between the „standard" parlours (1 unit/1 place) with about 4.4 (3.6 - 5.3) cows/place and h and the swingover-parlours (1 unit/2 places) with only 3.2 (2.5 - 3.8) cows/place and h (*Fig. 3*). Here the main disadvantage of sharing a unit between two places can be seen: a part of them is used as „parking area" for cows to ensure that the last cow of one side of the parlour is finished and her unit is free (all other cows are waiting already for being let out) when on the other side the unit is attached to the cow next to the last. Already 30 years ago [2] has pointed out the interaction of the two sides of a
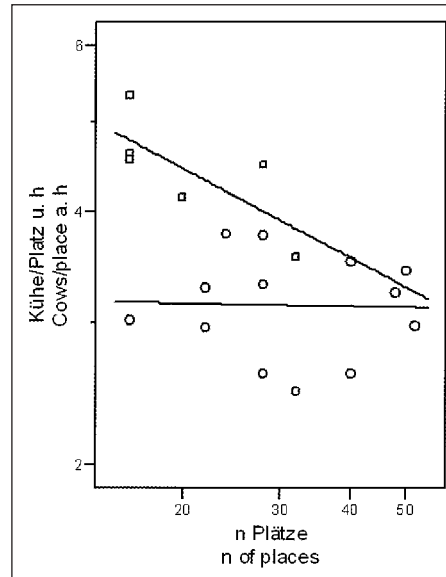
cow. This will result, however, in a bigger swingover-parlour, if the same performance should be attained (up to 120 cows/h; *Fig. 2*); or less WRT per cow is needed, respectively, in all „standard" parlours (up to 32 units and places) when compared to swingover-parlours with the same number of places (*Fig. 1*)! The MU, however, are better used in swingover-parlours (*Fig. 4*). This should not be overestimated, however, as the costs of a MU are relatively low compared with the costs of the milking installation.

cy on the number of places in the parlour. The correlation between increasing number of places and decreasing WRT is obvious:

swingover-parlour. Only by this stockpiling of places stalls it can be avoided that both groups in a parlour are waiting for one single
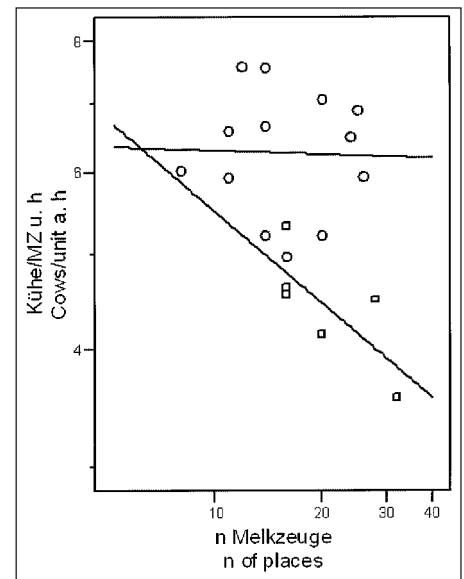
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