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Recording and planning farm management tasks

The data available in the area of farm management for planning purposes corresponds neither quantitatively nor qualitatively to the importance of these tasks. Using the example of dairy farming, reliable planning data was developed for these tasks. This study is based on the development of a systematic classification and a new methodical approach for data recording. The raw data form the basis for calculating the working time requirement in a calculation model. Depending on herd size, the working time requirement for farm management is between 8.3 and 37.6 MPh per cow and year. The percentage of the overall working time requirement taken up by farm-management tasks fluctuates between 13 and 24 %.

Keywords
Working time requirement, farm management, calculation model, dairy farming

Abstract
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The working-time requirement for farm management in agriculture has increased substantially, especially in relation to total working-time requirement. Essentially, the progressive mechanisation of farmyard and field tasks as well as an expansion of adiministrative activities are responsible for this increase. At the same time, the data available for planning purposes do not correspond to the actual importance of farm-management tasks in agriculture. With the aim of being able to plan work fully for a farm, several questions therefore arise:

- Is it acceptable to record production-related tasks with the known accuracy, without likewise taking account of farm management?
- Is work planning not only as good as its weakest link, and should the planning bases not therefore be on a par in both quantity and quality?

Up to now, the ergonomics with regard to farm management tasks have lacked not only work economics planning data but also basic concepts such as an effective and appropriate classification and a suitable analytical approach. This study examines tasks which can be assigned to dairy farming.

Farm management replaces „remaining work“ (in German: Restarbeiten)

The concept of farm-management tasks replaces the previous designation of “remaining work” (in German: Restarbeiten). Previously, the latter term encompassed non- or conditionally assignable as well as non- or conditionally plannable activities. In addition to elements of farm management (e.g. control and accounting), the remaining work included further activities (e.g. maintenance or cleaning tasks). In future, these tasks will be subsumed under the heading of special tasks. Both farm-management tasks and special tasks may be declared as assignable or non-assignable. Individual activities are assigned to a production method or a branch of farming. Viewed as a whole, remaining work is replaced by assignable and non-assignable farm-management tasks and special tasks.

New methodological approach

When gathering data, the methodological approach takes account of the special features of the farm-management tasks, since some of the latter are either non-plannable or scheduled, and hence differ substantially from directly production-related tasks. In addition, data collection that is both differentiated and farm-specific, and which allows representation of the working-time requirement for parts of farm management tasks, is made possible.

Essentially, data collection is based on the strict separation of influencing factors on the one hand, and work elements and work subprocesses on the other (**figure 1**) [1]. Determining the elements and subprocesses in an efficiency test has decisive advantages over the observation of work. The non-reproducible recording of measuring data during work observation is largely ruled out [2]. Auernhammer [3] describes the problem of the non-exact determination of a number of influencing factors,

and Hammer [4] mentions the disadvantage of absent observers. Carrying out efficiency tests avoids difficulties in these areas. In addition, non-plannable and non-scheduled tasks can also be included in the efficiency tests.

The recording of the influencing factors took place in the form of empirical studies. A personal interview is the first choice of survey method, since it lends itself to the recording of difficult issues. This empirical social research method is also mentioned by Luczak and Volpert [5] as a work-related empirical social-research instrument allowing both quantitative and qualitative research issues to be addressed. Forster [6] also elucidates the advantages of the personal interview, especially the way in which it allows a flexible reaction to different situations.

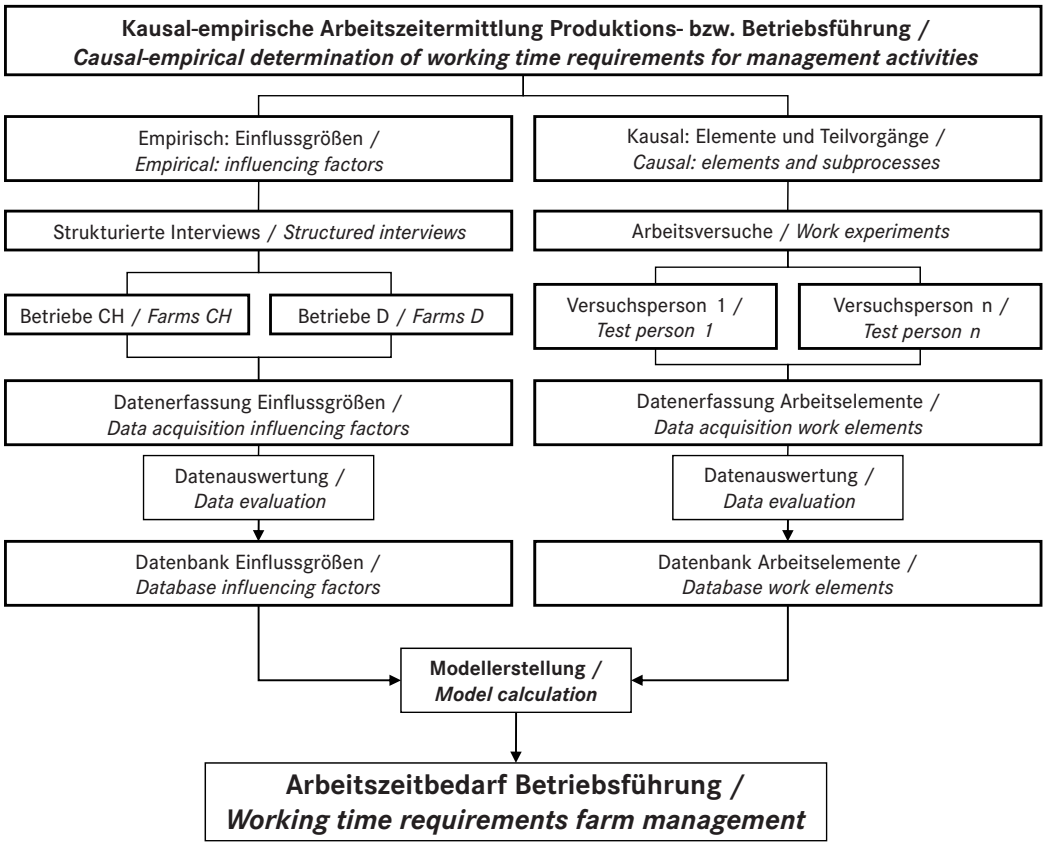
The data recorded were statistically analysed and filed in databases. Work elements and work subprocesses were then logically linked in a mathematical model in order to calculate the working-time requirement.

Results

The calculations for working-time requirement show that the known economies of scale of agricultural work processes also apply for management tasks. Broken down into different categories, two groups of management tasks emerge. The first group is characterised by a high proportion of individual-animal-related activities to be performed (e.g. breeding and stock planning). This means that the time requirement for these jobs rises with increasing herd size, and that there is consequently a strong positive correlation between the working-time requirement per herd and year on the one hand, and the number of cows kept on the other. For the second group of activities this correlation is close to nil, since none of the tasks to be performed in these categories (e.g. purchase of concentrated feed) is animal-related. A third group of activities represents an exception to the rule. Here, for instance, the time requirement for planning and organising work initially drops slightly, increasing once more in the case of herds with about 80 cows. Upwards of this herd size, additional apprentices and trainees as well as salaried foreign workers are employed.

The farms studied spend a total of between 263 MPh (7 cows) und 1 280 MPh (140 cows) on management tasks per herd and year. For larger herds, the working-time requirement for management activities per cow and year is in sharp decline (**figure 2**). In the present study, the figures are falling from 37.6

Fig. 1



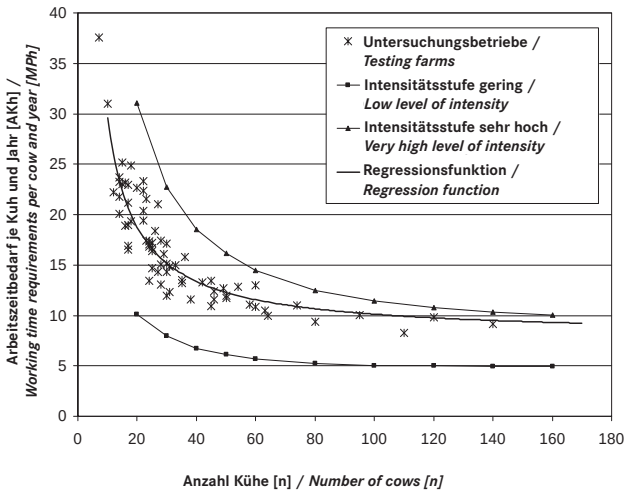
Methodical approach for data collection for farm management tasks

to 8.3 MPh per cow and year. This decline is particularly in evidence up to a herd size of about 60 cows. With larger herds, however, only low potential savings can still be expected.

Table 1 shows the working-time requirement for management tasks, broken down into the different categories. It should be noted how the values in the individual categories vary. In particular, planning and organisation as well as control tasks take up a great deal of time, and are far less amenable to reduction for large herds than e.g. information and further education. The allocation of management tasks to the individual categories also reveals that, depending on herd size, only between 10 and 12 % of all time devoted to management activities is spent on recordkeeping – often viewed as a massive drain on time and energy – as well as on applications. Generally speaking, however, all the applications must be filed subject to deadlines, which means a considerable amount of work from time to time. Consequently, time bottlenecks can certainly arise in the farm manager's office, although spread out over the entire year, this impression can be put in perspective.

The inclusion of calculation models yields a total working-time requirement of between 186.5 and 45.6 MPh per cow and year for the dairy farms studied. Therefore – in line with expectations, and even bearing in mind management activities – there is an obvious reduction in working time with increasing herd size. Management tasks take up between 13 and 24 % of total working hours, or an average of 18.3 %. This percentage shows no demonstrable dependence on herd size (**figure 3**).

Fig. 2



Working time requirements for farm management per cow and year in subject to the herd size

Conclusions

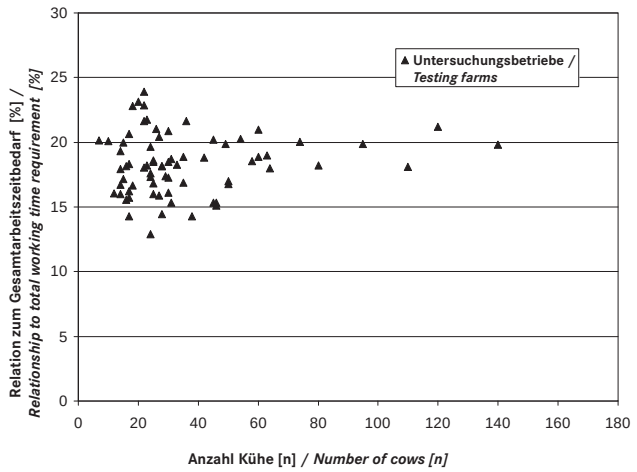
The present study shows that management activities account for a considerable proportion of the tasks in agriculture. In dairy farming, this amounts to around 20 % of the total working-time requirement. A comparison of the present investigation with earlier studies illustrates an increase in working-time requirement for management tasks. It can be assumed, that this share of overall working-time requirement will continue to rise further, since mechanisation, and hence a reduction in the time requirement for field and farmyard tasks, is still persisting. The absolute trend in working-time requirement depends above all on whether and to what extent additional administrative activities and recordkeeping duties are in store for farms, or whether simplifications will be achieved in this area.

Table 1

Working time requirements for farm management in dairy farming

Arbeitszeitbedarf [AKh/Kuh und Jahr] ***Working time requirements [MPh/cow and year]***	**Anzahl Kühe [n]** ***Number of cows [n]***				
	20	**40**	**60**	**80**	**100**
Planung / *Planning*	3.50	3.13	3.06	3.03	3.02
Kontrolle / *Controlling*	5.32	3.97	3.52	3.29	3.16
Aufzeichnungen / *Records*	1.45	1.09	0.97	0.91	0.87
Antragswesen / *Applications*	0.84	0.48	0.36	0.30	0.26
Einkauf / *Purchasing*	1.57	1.26	1.16	1.11	1.08
Verkauf / *Sales*	0.40	0.29	0.23	0.20	0.17
Geldverkehr / *Finance*	0.61	0.37	0.27	0.20	0.16
Buchführung / *Accounts*	0.39	0.22	0.16	0.13	0.12
Weiterbildung / *Further training*	5.49	3.31	2.34	1.77	1.38
Beratung / *Consulting*	0.29	0.22	0.20	0.20	0.20
Betriebsführung / *Farm management*	**19.9**	**14.3**	**12.3**	**11.1**	**10.4**

Fig. 3



Relationship of farm management work to total working time requirement

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