Comparison of dairy housing systems

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The dairy husbandry in the Federal Republic of Germany is mostly done in herds with 20 cows, including the youngsters in the herd. Only about 6,8% of all dairy farms have more than 40 cows and in these farms the youngsters are still included into the herd on the farm. As in more than 95% of all farms cows are kept in stanchion barns, high labour input in combination with a high work load indicates this type of housing. Also a high accident risk can be realized on this farms. To get in the future with a very slow ongoing change in structure of herd sizes better conditions for the labourers, improvements have to be worked out. By this the loose housing system with milking in parlour is the most important alternative.

In a comperative investigation practical orientated dairy housing systems were compared. Depending from today's situation the youngsters were always included into the reflected herds. For stanchion barns the assessment was done on herds with 20, 30 and 40 cows. For the loose housing systems the herd sizes reaches from 20 to 80 cows. For this type of housing three alternative typical housing systems were included in the assessment.

In a total of 14 system varieties four different parameters were taken. First of all the needed investment for buildings, other building constructions and for the technique was calculated. After this the demanded labour requirement and the expected work load was investigated. Finally the required electrical energy input and the resulted costs p.a. for a comprehensive judgement were analysed.

Within the capital requirement the stanchion barns are always more favourable, than the loose housing systems. Equal values per cow and youngster for a herd with 20 cows in a stanchion barn can be reached in a loose housing system with at least 40 cows. With 30 cows in a stanchion barn the comparable loose housing system should have 70 cows. As favourable values with 40 cows in a stanchion barn in loose housing systems can never be reached. In a general these dependencies are caused on smaller areas with covered buildings und with less space in the needed buildings for stanchion barns. Additionally in loose housing systems the parlour needs a very high amount of investment too.
In the labour requirement the stanchion barns with herd sizes

below 30 cows are more favourable always than loose housing systems. Between 30 and 40 cows the advantages of loose housing systems are very small. Against these results the work load in the stanchion barns is much more unfavourable than in loose housing systems. Based on the energy convertion method for physical work stanchion barns charge a male worker with nearly 80% of his performance per day. Female workers are overloaded by stanchion barns in an average of more than 30%. But even the loose housing systems lead by the heavy work of feeding to a considerable overload of female workers. Only the very small loose housing system with a single cubicle row on each side of feed passage and manger offers work load below the continous output limit of female workers.
In the electrical energy requirement the relative high connection factors from 18 kW for stanchion barns and 22 kW for loose housing systems are determined. In contrast to this the electricity consumption values per cow and year shows a reverse picture. Stanchion barns require for their ventilation nearly twice requirements contrary to comparable loose housing systems.

Last not least the annual costs per cow and year are within a very small band for all investigated alternatives. Always the stanchion barns are the most favourable forms within this comparison. In a contrary to the loose housing systems the difference between 30 and 40 cows is very small and nearly not to be seen. Therefore the resulting work load will be the most important point for a decision for the one or the other system and inspite of this the loose housing system will be preferred always.

As a final decision the rentability of dairy housing systems has to be taken into account. It is shown, that under today's production rules new buildings can never be used in a profitable way, even not for the big herd sizes of 80 cows. Exceptionally, herd sizes beyond this level can be kept just for family concerns with enough income out of the dairy husbandry or with a high part of do-it-yourself in building erection together with farm own material and with useable old building volumes. Profitable herd sizes are then given with at least 30 - 35 cows.