SUMMARY

The interest in cubicles for dairy cows has grown during the last few years. The hygiene and health of the cows should be satisfied at the same time as less bedding material and work is to be obtained in order to increase the economic outcome of the production. There are a lot of different artificial bedding materials on the market, hard and soft rubber mats, thick rubber mattresses made of recycled rubber, mattresses with two layers, and a waterbed. New materials are under development. The demands upon the flooring material are numerous. It should be soft but stable, not too slippery, give cow comfort, be easy to keep clean, have a long lifetime, demand less bedding material and be a good investment for the farmer. It is inevitable to avoid compromises, as the demands often are contradictory.

In the literature review field studies of different types of surface materials used for dairy cows, during mainly the 90s have been summarised. Technical evaluations of different surface materials are made at DLG in Germany and also at the Danish Institute of Agricultural Sciences, Bygholm. A study visit was made to Research Centre Bygholm, and a short description of the results from the evaluation is included. Field studies are most of the time made in free stall buildings for dairy cows. The cow behaviour and preference are observed and evaluated, and also the hygiene and health of the cows to see what are the benefits of the different surface materials. Problems related to these studies are that factors like the age of the cows, their stage of lactation, social factors and environmental factors may also affect the results. Concrete does not seem to satisfy the demands on a good surface material for dairy cows unless it is covered by a thick layer of bedding material, between 10-15 cm. In order to replace this big demand of bedding material and still give the cow acceptable comfort, a number of new synthetic mats and mattresses for cubicles have been developed. None of the existing surface materials satisfies all of the demands. When the cow is lying down up to 75 percent of her live weight is placed on the front knees. A penetration of 16-28 mm radically reduces the pressure against the fore knee of the cow. The cows prefer a soft lying area. It does not seem that any special type or thickness of surface material is better than some other, but there are better and less good surface layers. With a softer layer in the cubicles less bedding material is needed, fewer injuries occurs on the cows and a more normal behaviour of the cows is attained. It’s important to maintain a minimum amount of bedding on the artificial layers.

In this study two of the latest marketed products of surface materials was compared with a hard rubber mat. The hard rubber mat, UBO, has been sold since the 60s and was compared with the mattress Cow-comfort. It is a Danish product developed under the 90s and sold in Sweden by BS-agro since about two years ago. The mattress is 10 cm thick with recycled rubber inside and a permeable outer fabric. The third material was Alanta Waterbed sold by Rubber Company since 1999. It is a 9 mm thick rubber mat, about 50 mm thick with water filled in it. The field study started four weeks after the materials were installed in a freestall barn in November 1999. A preference test was made during five days and nights. After that a study of lying down and rising behaviour was made during 16 days and nights. During the study the employees twice a day noted the cleanliness of the cubicles.

The field study showed that Alanta Waterbed had the higher lying time and most lying periods of the three surfaces. The average standing time had a tendency to be lower which is considered to be good. In the lying down behaviour Alanta had the shortest time and fewest interruptions of the materials. The opinions of the employees also were positive. It was rather clean and was easy to keep clean. It seemed to be the best on average of the beds included in this study. The results for the mattress did not differ from the hard rubber mat in the preference study but showed shorter lying down behaviour and fewer interruptions than the hard rubber mat. The mattress was considered to be the hardest to keep clean and had a few observations where milk leakage was found on the surface. The UBO mat showed longer lying down behaviour and more interruptions during lying down than the other beds but the difference was not significant to the mattress. It was considered by the employees to be the cleanest and easiest to keep clean of the surfaces.

The development of new surface materials is in progress. The new beddings are better satisfying the comfort, health and hygiene of the cows than the hard rubber mats resulting in a reduced demand of bedding material. However, they often are more difficult to keep clean. The function of the surfaces are influenced by many factors and the price ranges between 600-1300 SEK per cubicle. This implies the choice of surface materials for the cubicles to be a long time investment in the comfort of the cows and for the economy of the farmer.