

Does the automation level of a dairy farm affect animal welfare?

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The number of automation technologies for dairy cattle farming has increased significantly in Germany in recent years, with most technologies focusing on labor-saving and providing relief from physically strenuous labor for farmers. Thereby, automatic milking and feeding systems as well as automatic manure removal and bedding technologies are now commercially available. The influence of these technologies on individual aspects of animal welfare has already been investigated to a certain extent, but there is still a lack of knowledge about the impact of increasing farm automation through various combinations of these technologies. Therefore, the aim of this study was to examine whether the degree of automation on a dairy farm affect welfare indicators of dairy cows from the Welfare Quality® Assessment protocol.

To achieve this aim, 32 trial farms in Northern and Central Germany were categorized into varying automation degrees using a newly developed classification system. The Welfare Quality® Assessment protocol for dairy cows was used to conduct welfare assessments on all participating farms by one trained person. Using analysis of variance (ANOVA), overall welfare scores and individual measures from the protocol were compared across farms with differing automation degrees.

No significant differences were observed in overall welfare scores, suggesting that the influence of automation does not exceed other farm-related factors influencing animal wellbeing, such as housing environment or management methods. However, significant effects of milking, feeding, and bedding systems on the appropriate behavior of cattle were observed. Thereby, higher degrees of automation had a positively affect the human–animal relationship and led to positive emotional states, as cows in highly automated farms are less disturbed and experience greater freedom. Moreover, farms with higher automation degrees had significantly lower scores for the prevalence of severe lameness and dirtiness of lower legs. It could be concluded that a higher degree of automation could help to improve animal welfare on dairy farms. The developed classification system was well-suited to reach the aim of this study and can be utilized for further research related to automation in dairy farming.