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## What drives dairy farm food safety practices in Bangladesh? Evidence from a PLS-SEM model

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### Abstract

Milk production in Bangladesh has been growing in recent years along with the expansion of commercial dairy markets. However, the structure of dairy farming in Bangladesh is still overall resource-poor and small-scale, and constitutes a primary- or subsistence occupation to many farmers with markets shaped by informal nearby selling points. Commercial milk collection centres and the availability of farm door-level local milk collectors at rural dairy villages had encouraged more dairy producers to be market oriented. However, poor food safety practices result in rapid disease transmission among cows and contaminated marketable milk. Therefore, improved farm hygiene practices would be of great benefit for milk quality and safety in Bangladesh. In this study, a total of 498 non-subsistence dairy producers from three different agro-climatic zones in Bangladesh were personally interviewed. Six major groups of food safety practices were formed from 73 food safety measures that were surveyed at the farm level. The resulting categories represent safety issues during milking, milk storage, health management, hygiene record keeping and cow raising environment. Partial least square structural equation modelling (PLS-SEM) was adopted to analyse measurement models of the latent variables named knowledge, attitude, barriers, farm resources and food safety with their respective multiple indicators ( $\geq$  three indicators for each construct reflection). The inner model was developed with possible interaction among the latent variables whereas the food safety index was the main latent endogenous variable in the model. The estimated direct path coefficient towards the food safety index indicated that higher hygiene knowledge and attitude significantly induced producers to intensively adopt safety measures. However, farm resources enhanced adoption of safety practices indirectly, through its direct significant effect on knowledge and attitude. Surprisingly, safety inspection institutions had no significant effect on milk safety oriented dairy farm management. From the multigroup analysis, rather no constructs were found to exhibit significant differences between different dairy markets and climate zones. Therefore, it cannot be rejected that milk hygiene issues in Bangladesh are primarily subject to individual- and household level decisions, while structural and geographical issues seem to be of minor importance.

**Keywords:** Bangladesh, dairy farm, food safety, PLS-SEM