Milk Yield Gaps and their Determinants in Smallholder Farms in a Semi-Arid Ecosystem of Kenya

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Abstract

Relative milk yield gaps computed as the difference between actual and potentially attainable yield provide insight of how much production can be increased in practice with locally available resources and technologies. We applied bench-marking approach with the principle that some farmers are able to attain higher productivity levels than the typical farmer despite facing similar resources, challenges and trade-offs. These top performing farmers likely do allocate production resources differently, which may inform prioritisation of promising intervention options from local production experiences for closing yield gap presently observed in milk production. The study quantified the magnitude in milk yield gap and to identify differences between top 10 % farms and typical farms that could point to the promising interventions for closing the milk yield gaps. The bench-marking approach was applied to survey data from smallholder dairy farms in a semi-arid region of Kenya. Milk yield per cow per day was 14.6 liters in the top farms and 6.3 liters in the typical farms, which translates to 57.4 % yield gap. This implies that a typical farm is currently producing at 42.6 % below the potential attainable yield and has the potential to increase yields by 134.9 %. Paired comparisons of the least square means between the top and typical farms consistently showed that top farms invested more in external sourcing of feed, water and labour to supplement on-farm resources, veterinary services for disease control to improve herd health and in artificial insemination to improve breed quality. This demonstrates that the difference between top performing farms and the typical farms is use of external resources. At the present attained productivity levels, results show that farmers can more than double their milk yields through efficient use of external inputs and services. Therefore empowering farmers with knowledge, skills and networks that enable them to access and efficiently use external inputs and services is recommended for interventions targeting closing the yield gaps. This can be attained through strengthening farmer cooperative movement to ease access to input and output markets with check-off arrangements for payments.

Keywords: Bench marking approach, external inputs, survey data, top farms, typical farms

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