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Heterogeneous Treatment Effect of Maize Ensiling on Production Stability among Smallholder Dairy Producers in Kenya

Oscar Ingasia Ayuya[1], Gonne Beekman[2], Asaah Ndambi[3], Jan van der Lee[4]

[1] *Egerton University, Agricultural Economics and Agribusiness Management, Kenya*
[2] *Wageningen University and Research, Wageningen University & Research,*
[3] *Wageningen University and Research, Wageningen University & Research,*
[4] *Wageningen University and Research, Wageningen Livestock Research, The Netherlands*

Abstract

Seasonal variability in feed supply and availability is a major challenge to increasing dairy production under smallholder systems. This could be addressed through appropriate feed management techniques, for instance in form of silage or hay, which is increasingly being demanded in commercial dairy production in developing countries. Conserving forage as silage is an option to alleviate feed constraints in dairy production systems. Maize (*Zea mays*) silage is one of the solutions that is being considered to deal with deficit of feed for dairy cows in Kenya due to the persistent dry spells. This is because it can be used as an energy and fiber source for cattle, mainly for dairy cows and may have implication on ensuring stability in milk production and consequently food security. This study provides empirical evidence on determinants of adoption of maize silage and heterogeneous treatment effects maize ensiling on dairy cow milk production stability among smallholder producers in Kenya. Multistage sampling technique was used to select 349 respondents. Data was collected using a semi structured questionnaire though face-to-face interviews. The stratification multilevel and matching-smoothing approach of treatment effects was used to determine the heterogeneous treatment effects of maize ensiling in smallholder production system. Adoption of maize silage was enhanced by higher level of education of the household head, more frequent contacts with extension service providers and training on fodder production. Further, larger herd size and higher dairy related assets enhanced adoption of maize ensiling. Producers with high socioeconomic and institutional characteristics benefited most maize ensiling in terms of production stability. To such programme planners aimed at enhancing technology adoption, the implied assumption of homogenous treatment effect maize ensiling does not always hold.

Keywords: Adoption, dairy cow, heterogeneous treatment effect, Kenya, maize silage, smallholder producers

Contact Address: Oscar Ingasia Ayuya, Egerton University, Agricultural Economics and Agribusiness Management, Box 536 Egerton, 20115 Nakuru, Kenya, e-mail: ingasiaoa@gmail.com