

## **Abstract**

### **Aim:**

Cows on smallholder dairy farms (SDF) in developing countries such as Kenya typically produce volumes of milk that are well below their genetic potential. An epidemiological study was conducted to determine reasons for this low milk production, including limited use of best management practices, such as suboptimal nutritional management.

### **Methods:**

An observational cross-sectional study of 111 SDF was performed in Nyeri County, Kenya in June of 2013 determining the effect of cow factors, farmer demographics and farm management practices on the volume of milk sold per cow per year (kg milk sold/cow). In particular, the effect of feeding high protein fodder trees and other nutritional management practices were examined.

### **Results:**

Approximately 38% of farmers fed fodder trees, but such feeding was not associated with volume of milk sold per cow, likely due to the low number of fodder trees per farm. Volume of milk sold per cow was positively associated with feeding dairy meal during the month prior to calving, feeding purchased hay during the past year, deworming cows every 4 or more months (as opposed to more regularly), and having dairy farming as the main source of family income. Volume of milk sold per cow was negatively associated with a household size of >5 people and feeding Napier grass at >2 meters in height during the dry season. An interaction between gender of the principal farmer and feed shortages was noted; volume of milk sold per cow was lower when female farmers experienced feed shortages whereas milk sold per cow was unaffected when male farmers experienced feed shortages.

### **Conclusions:**

These demographic and management risk factors should be considered by smallholder dairy farmers and their advisors when developing strategies to improve income from milk sales and animal-source food availability for the farming families.

### **Keywords:**

Dairy cattle nutrition, management factors, livelihood, smallholder farm