1. Introduction
Locally available tree resources are seldom considered in livestock feeding strategies in spite of their nutritional potential to supplement grass forages. Fodder trees can supplement feed gaps during periods of extreme weather conditions. Several are sources of high crude proteins, minerals and energy. Knowledge on fodder tree qualities and availability may be responsible for low utilization. This work sought to avail new knowledge on locally available tree fodder resources for use in alternative feeding strategies by smallholders in mixed dairy production systems in central parts of Kenya.

Objectives of the study:
- Assess fodder tree diversity that can be used to supplement present livestock forages in Githunguri, Lari and Kayata in Kenya
- To characterize common livestock feeds used by dairy farmers in different livestock production systems

2. Materials and Methods
- The survey covered Githunguri and Lari districts in humid livestock production zone and Kayatta division representing arid livestock system (Fig. 1).
- A total of 117 households were randomly selected from the Githunguri dairy cooperative and Kayatta irrigation membership records.
- Household socio-economic characteristics such as: land sizes, number of livestock reared, types of feed resources utilized were recorded using questionnaires during interviews with farmers.
- Inventories of fodder tree species on farm was conducted through farm walks and recording of species inventory sheets.
- ANOVAs was used to detect differences among and between fodder production areas; General linear regression analysis was used to assess factors influencing tree fodder diversity on farms.

3. Results and Discussion

3.1 Feed and forage types
- Common feed and forages used: napier grass (98%); maize-bean stover (86%); banana stems (60%); dairy meal (60%), hay (58%) and fodder trees (58%).
- Feed types used were most diverse in Githunguri (21) followed by Lari (18) & Kayata (11).
- 60 fodder tree species (38 indigenous, 22 exotics) belonging to 27 botanical families were identified.
- 17,546 fodder tree individuals were counted comprised of 2,532 indigenous and 15,014 exotics.
- Exotics such as Grevillea robusta (79%), Persea americana (78%) were frequent across the surveyed regions.
- Calliandra calothyrsus and Grevillea robusta were most abundant on farms in Lari and Githunguri while Acacia tortilis and Mangifera indica were abundant in Kayata.

3.2 Fodder tree diversity per farm
- Average fodder tree richness on farm was 7 including 3.5 exotics and 3.3 indigenous species.
- Species richness was higher in Kayatta, compared to Lari and Githunguri.
- Total trees & indigenous richness and abundance were significantly higher in Kayatta than Githunguri and Lari (Table 1).

3.3 Factors affecting tree diversity
- Age, gender and HH education level had no significant influence on tree diversity.
- Farm size had positive influence on total & exotic species richness and indigenous species abundance (Table 2).
- Number of dairy cows had a negative influence on total tree richness, exotic richness and total indigenous individuals.

3.4 Comparison of fodder tree diversity on farms
- Total tree richness on farm was 7 including 3.5 exotics and 3.3 indigenous species.
- Species richness was higher in Kayatta, compared to Lari and Githunguri.
- Total trees & indigenous richness and abundance were significantly higher in Kayatta than Githunguri and Lari (Table 1).

Table 1: Average number of fodder tree richness and abundance across the three study areas.

<table>
<thead>
<tr>
<th>Study area</th>
<th>Total species richness</th>
<th>Indigenous species richness</th>
<th>Exotic species richness</th>
<th>Total no. of individuals</th>
<th>Indigenous individuals</th>
<th>Exotic individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lari (40)</td>
<td>5.4b</td>
<td>2.3b</td>
<td>3.1b</td>
<td>78.4a</td>
<td>23.9b</td>
<td>54.5a</td>
</tr>
<tr>
<td>Githunguri (40)</td>
<td>5.4b</td>
<td>2.5b</td>
<td>2.9b</td>
<td>165.8a</td>
<td>16.9b</td>
<td>148.9a</td>
</tr>
<tr>
<td>Kayatta (37)</td>
<td>10a</td>
<td>5.9a</td>
<td>4.1a</td>
<td>210.2a</td>
<td>73.3a</td>
<td>137a</td>
</tr>
<tr>
<td>Total</td>
<td>6.8</td>
<td>3.5</td>
<td>3.3</td>
<td>292.4</td>
<td>37.1</td>
<td>112.8</td>
</tr>
</tbody>
</table>

Note: Values in columns followed by different letters are significantly different at p<0.05 according to ANOVA and post-hoc test.

4. Conclusions and Recommendations
There was high presence of exotic species and fewer indigenous fodder species available to support dairy production in systems in central parts of Kenya.
Interventions that will increase planting and utilization of fodder tree which are more nutritious can help stabilize smallholder milk production.
New strategies are required to help promote uses and conservation of indigenous fodder tree species, found to be few in the studied areas.