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Livestock keepers' objectives and performance of dairy camels under two contrasting management systems in Ethiopia

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Abstract

Dromedary camels are essential to pastoral and agro-pastoral livelihoods in Ethiopia's arid and semi-arid regions, yet their reproductive and dairy performance across management systems remains poorly understood. This study evaluated dairy camels in extensive pastoral (EP) and peri-urban agro-pastoral (PUAP) systems in the Borana and East Shewa region, respectively. Data on herd characteristics, herders' production objectives, reproductive performance, and lactation performance were collected from 48 camel herds and 135 lactating camels between November 2024 and October 2025 using structured questionnaires, direct observations, and on-site measurements. Milk production was the primary reason for keeping camels in both systems, more frequently reported in PUAP (83.3 %) than in EP (70.8 %). Income generation was reported only in EP (29.2 %), while religious purposes were exclusive to PUAP (16.7 %). All herders in PUAP prioritised milk yield, whereas EP herders considered milk yield alone (29.2 %) or in combination with milkability (70.8 %). Camels in PUAP were significantly older (188.7 ± 42.5 vs. 135.1 ± 38.0 months; $p < 0.001$) and had higher reported ages at first heat (55.2 ± 4.4 vs. 47.3 ± 4.4 months), first mating (56.3 ± 9.2 vs. 48.5 ± 3.8 months), and first conception (61.2 ± 8.7 vs. 50.8 ± 4.8 months), as well as a higher age at first calving (73.1 ± 8.6 vs. 62.0 ± 5.1 months) (all $p < 0.001$). Despite shorter lactation (10.6 ± 1.3 vs. 16.4 ± 4.1 months) and milking periods (9.1 ± 1.6 vs. 16.7 ± 4.2 months), PUAP camels showed better reproductive efficiency, with fewer matings per conception (1.8 ± 1.0 vs. 2.3 ± 0.9), higher numbers of calves born (4.8 ± 2.1 vs. 3.1 ± 1.3), and fewer abortions (0.3 ± 0.8 vs. 1.2 ± 0.7) (all $p < 0.001$). Differences in performance show that production systems strongly shape camel productivity. PUAP systems achieve higher reproductive efficiency and calf output despite delayed reproductive onset and shorter lactation periods. EP systems benefit from earlier reproduction and longer lactation but are limited by lower reproductive efficiency and higher losses. Results highlight need for system-specific interventions, improving reproductive management in pastoral systems and optimising lactation in peri-urban systems.

Keywords: Agro-pastoral systems, dairy production, dromedary camel, pastoral systems, performance, reproduction

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