Characteristics of Dairy Farms along the Rural-Urban Interface of the Emerging Megacity of Bangalore, India

Marion Reichenbach[1], Ana Pinto Garcia[2], Sven König[2], Raghavendra Bhatta[3], Eva Schlecht[4]

[1] *University of Kassel, Animal Husbandry in the Tropics and Subtropics, Germany*

[2] *Justus Liebig University Giessen, Inst. of Animal Breeding and Genetics, Germany*

[3] *National Institute of Animal Nutrition and Physiology, Inst. of Animal Breeding and Genetics, India*

[4] *University of Kassel / Georg-August-Universität Göttingen, Animal Husbandry in the Tropics and Subtropics, Germany*

Abstract

While the beginning of agriculture initiated the first human settlements, maintenance of ecosystem services provided by agricultural production systems gets more complex with the fast urbanisation trend and corresponding diet changes of modern times. In Africa and Asia, megacities are emerging fast but still rely on (peri-)urban agriculture to supply their urbanised population; they offer the opportunity to gain deeper understanding of transition processes in agriculture. The aim of this study was to identify and characterise the multiple dairy production systems in the rural-urban interface of Bangalore with its high demand for dairy products, thereby focusing on their intensification level. Qualitative and quantitative survey data on socio-economic status of the household, resources availability, dairy herd composition and management, and in- and output markets were obtained from 337 dairy farms across six strata (1= urban to 6= rural). SPSS two-step clustering was applied to the dataset to identify major dairy production systems. Kruskal Wallis and Chi-squared tests were used to further characterise each system. Four dairy production systems were identified based on five main parameters: spatial location along the six strata, proportion of exotic breeds in the herd, cattle in- and outflow, use of pasture, and reliance (at least partial) on own production of forage. Strongest dichotomies between the dairy production systems were observed (i) in the reliance on own forage production: most of the dairy farmers at least partially supplied own green forage to their herd, while others bought it or relied on (free) market waste or forage collected from public places, and (ii) in the use of pasture: some dairy farmers, mainly the ones with a highly specialised herd - that is exotic genotype - did not send their cattle to pasture because of heat stress, while others, keeping from little to also highly specialised herds, did. Interestingly, no dairy production system was exclusively limited to the inner-urban areas; rather a semi-intensive dairy production-mixed herd composition, no animal in- and out-flow, pasture use but no own forage production - was common to both urban and rural areas, while semi- to highly intensive production systems were limited to rural areas.

Keywords: Cluster analysis, dairy production system, farm classification, India, rural-urban interface, urbanisation

---

Contact Address: Marion Reichenbach, University of Kassel, Animal Husbandry in the Tropics and Subtropics, Mauerstr. 12, 37073 Göttingen, Germany, e-mail: marion.reichenbach@uni-kassel.de