Welfare Assessment Protocols in Dromedary Camels

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Camel is a vital source of life for the people acclimatizing the deserts and hard-off areas where there is harsh condition to live in (Faraz *et al*., 2019*a,b,c*). The camel is very suitable species of arid, semi-arid and desert plains and providing functional food like milk and meat for the inhabitants; hence playing a chief eclectic role as food security candidate (Faraz, 2020*a,b*; Faraz *et al*., 2020). Beside these important roles, their welfare is compromised usually which highlights the welfare studies in camel (Menchetti and Padalino, 2024). An effort was implanted as publishing a book chapter on camel housing and good/friendly management practices in dromedaries (Faraz *et al*., 2024). Moreover, detailed welfare trials/projects are required to cover this scanty area of study.

Welfare assessment in dromedary camels was studied in Pakistan under the projects funded by Animal Angels (Germany). Two projects were assigned to Dr Barbara Padalino from University of Bologna, Italy in 2023 and 2025. Dr Asim Faraz from Bahauddin Zakariya University Multan Pakistan was team leader from Pakistan. Different camel scientists/workers and coworkers were involved in the project like Dr Patrick Mayer Glitza (Germany), Dr Naod Thomas Masebo (Ethiopia), Dr Ali Raza Abbasi (Cholistan Development Authority), Dr Abdul Waheed (BZU), Dr Nasir Ali Tauqir (IUB), Dr Anam Zohra (IUB), Dr Hassan Qadir Buzdar (BZU), Dr Faizan Saleem (BZU), Mr Viladi (Multan), Mr Liaqat (Jalalpur Peerwala) and Mr Shah Baig (Mandi Yazman).

The International team visited Pakistan in 2023 and 2025 for the study trials. Dr Asim Faraz hosted the delegates and the Government of Pakistan provided full security and hospitality to the delegates. Work started in 2023 from the field area of Multan near Pul Nobahar, Nag Shah Chowk/ Shershah Town, Mandi Yazman and Bahawalpur area (Cholistan desert area) for the assessment of the welfare protocols in camels under pastoral conditions, very first time in Pakistan.

In this regard, two papers have been published in the Q1 journals establishing the welfare protocols and some novel techniques about the environmental temperature and relative humidity associations with flank and ocular temperatures in camels. The first paper entitled "Welfare assessment of dromedary camels kept under pastoralism in Pakistan" was published in Frontiers in Veterinary Science in 2024 (Padalino *et al*., 2024).

While second paper of this series was published in 2025 in Q1 journal "animals" entitled "Association of environmental temperature and relative humidity with ocular and flank temperatures in dromedary camels" enlightening very novel technique about the association of ocular and flank temperature of dromedary camels measuring by infrared thermography and their association/relationship with environmental temperature and relative humidity which can give a clear picture about the well-being and stress factor in dromedary camels (Faraz *et al*., 2025).

After the successful completion of this very novel project of worth 10,000 euros, there was a concept to do welfare working in camels during the transport system. Dr Barabara Padalino worked in Qatar and Egypt for the transportation and then discussed the theme with Dr Asim Faraz to work in Pakistan. Then by the approval of the project of worth 45,000 euros by Animal Angels, they started work in Pakistan in 2025. Dr Asim Faraz and his team did extensive work in the project from Pakistan chapter and completed two segments, first at Samson's Farms with the collaboration of Dr Dilshad about the self-loading and self-unloading in dromedary camels. And second part with the welfare assessment during the transportation of camels to the slaughter houses in Kasur and Lahore (Dr Ali Raza Abbasi helped in this system with his team).

About two main publications were completed in this regard in Q1 journals. First publication was with the title "How to apply positive-reinforcement-based training for self-loading and self-unloading in dromedary camels" in animals (Masebo *et al*., 2026). This study enlightens the self-loading and unloading in the dromedary camels under the trained protocol. For transportation the loading and un-loading is major problem in livestock especially for camels, so after this training there are chances of injury/stress and hustle free loading and unloading of the camels (very first time in Pakistan, also novel for the dromedary camels in the world).

The second part of the tracking of the camel journeys (really very hectic job), butr the teams did it very efficiently and completed the tasks. The work has been published in Frontiers in Veterinary Science with the title "Development of a welfare assessment protocol for dromedary camels during road transport" (very novel work in the world of camel science) in 2026 (Padalino *et al*., 2026).

The scientists' teams are very much committed in this regard, and looking forward to the more opportunities in future. They are enthusiastic to work in collaboration for the betterment of camelids and humanity. The work will be presented in many international conferences for the propagation and sharing with the camel world.

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