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Cattle care gets a leg-up

Indian's invention helps early detection of lameness in milch cows

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AN Indian mechanical engineer is rapidly emerging as the dairy industry's wunderkind, with his invention helping in early detection of lameness in milch cattle.

Lameness is a major issue in the dairy industry, with 10-40 per cent of the herd lame at any given time. Immobility directly affects productivity, with each incident of lameness costing upto $400, or a billion dollars just in the US every year. The implications are greater for the rest of the world.

StepMatrix, the fully automated machine developed by Chandrapur, Vidarbha-born Parimal Rajkondawar and a team of researchers, takes less than five seconds to detect cattle lameness.

"As the cow walks over the machine, comprising two parallel force plate systems, the alogrithm detects the forces exerted by each limb and maps them to a numerical score by a statistical model. These scores are tracked over a period of time by a user-interface software to detect deviations from the normal walking pattern. If the cow is in pain, she will put less force on that particular limb. This will reflect in the lameness score and the cow can be sent for immediate treatment," says Rajkondawar.

Without the machine, lameness-detection is a tedious visual observation process that often failed to save cattle and, consequently, bottomlines.

The bulk of Rajkondawar's research was conducted in the Baltimore University in the US, where he shifted in 1996 for his PhD after completing his MTech from Mumbai. His thesis 'Development of Lameness Detector Device for Dairy Cattle' was written under guidance from agro-engineering expert Uri Tasch.

Subsequently, Rajkondawar developed a statistical model and a software that enabled Bou-Matic, the third largest dairy automation company in the world, to actually manufacture the machine. It was launched for global sales at the World Dairy Expo in Madison, Wisconsin, in October this year.

"Recently, Bou-Matic received a half-million dollar research grant from the United States Department of Agriculture to further research bovine lameness detection using the StepMatrix. At present, StepMatrix works only for dairy cattle. The new research is focusing on developing similar machines for horses, sheep, mice and monkeys," says Rajkondawar, who has applied for a patent on the software.

MOO MACHINE: At the World Dairy Expo (above) . Inset: Parimal Rajkondawar

While quadrupeds may not be able to express their gratitude for the machine, Tasch, professor in robotics and animal well-being at the Department of Mechanical Engineering, at Baltimore University, is fulsome in his praise.

"Rajkondawar has had a profound impact on the StepMatrix and without his contributions the system would have remained an academic paper collecting dust on my office shelf," he says.