Automated Detection of Lameness in Dairy Through Measures of Weight Distribution

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Lameness is a costly and widespread health and welfare problem in intensive dairy production. The increasing size of dairy farms makes lameness detection difficult, showing the need for automated detection methods. We examined whether measures of how cows distribute their weight between their four legs when standing could detect lameness. Of a group of 48 cows, those with high gait scores indicating lameness, showed a greater difference in weight within a contralateral pair of legs and tended to switch weight between legs more frequently. Injections of a local anaesthetic into the leg responsible for lameness in 6 cows reduced this difference. Practical use of this method depends on knowing the conditions that might affect how cows distribute their weight. We found that cows shift weight between contralateral legs but do not shift weight from front to back or vice versa. 56% of the weight is on the front legs but comparisons before and after milking and before and after calving show that the weight of milk is carried mainly (90%) on the back legs while the weight of the calf is distributed between both front (53%) and back legs (47%). The percent of weight distributed between front and back legs is not affected by elevation of the front legs. Measures of weight distribution while cows are standing show great potential as an automated method of detecting lameness but the conditions that affect how cows distribute their weight must be understood.