



SCC DIAGNOSTICS TOOL BOX



R-MR-9: Sources of Variation in Milk Flow Characteristics at Udder and Quarter Levels

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Abstract

The aim of this study was to describe and analyze effects of parity, stage of lactation, milkability (3 groups of cows with differing peak flow rates), time of milking, and quarter position on milk production and milk flow measures at udder and quarter levels. Particular emphasis was put on changes to the decline phase and in duration of overmilking. More than 75,800 quarter milk flow curves and more than 19,300 udder milk flow curves obtained from 38 cows throughout lactation were analyzed. Stage of lactation significantly influenced all studied variables at both udder and quarter levels. At the quarter level, the duration of decline phase and the decline ratio (decline phase as a percentage of milking time) decreased from mo 1 to 2 and then gradually increased as lactation advanced. In contrast, at the udder level, duration of decline phase decreased throughout lactation but beginning at mo 2, the decline ratio increased as lactation advanced. The duration of the overmilking phase of quarters increased from mo 1 to 3 and then decreased in the course of lactation. Parity did not influence peak and average flow rates, the duration of increase phase, or the decline ratio at either udder or quarter levels. All milk flow measures were higher during morning milking except the duration of increase and decline phases at the quarter level and the duration of increase phase at the udder level. Milk yield and the duration of increase phase were not affected by milkability at either level. Quarters from udders with high milkability had longest duration of decline phase and the shortest overmilking phase. Milkability did not influence duration of the decline phase at the udder level. Quarter position influenced all measured variables of milk yield and milk flow. Rear quarters had significantly higher milk yield, longer time of milking, higher peak, and higher average flow rates than front quarters. Front quarters had shorter duration of increase and decline phases than rear quarters. The duration of the overmilking phase was almost double for front quarters. There were also differences in measured flow rates between left or right quarters on respective front or rear positions. Measured characteristics reported in this study may be important in setting default parameters in automated milking systems.

Key words: milk flow pattern, cow, quarter, udder

