

Effect of milk intake and weaning strategy on measures of calf performance and feed utilization in group-housed Jersey calves

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Introduction

Increased milk intake in the preweaning period has been associated with improved rate of gain, improved health, reduced age at first calving and improved first lactation milk production. However, feeding higher levels of milk may slow starter pellet intake, delaying rumen adaptation, which can result in reduced rate of gain and impaired health in the post-weaning period. The study objective was to describe the effect of milk feeding rate and weaning strategy on measures of growth, health, feed intake, feed efficiency and economics in group-housed preweaned Jersey calves.

Materials and Methods

The study was conducted on a large commercial Jersey farm in MN in the summer of 2013. Heifer calves were moved to group housing with automated feeders and 20 calves/pen at ~18 days of age. A 2 x 2 factorial design was used to randomly assign pens to one of four treatment groups (HM/AW, HM/GW, MM/AW, MM/GW) based on milk allowance and weaning strategy:

Milk allowance: High milk (HM, 9 L/day) versus Moderate milk (MM, 7.5 L/day)

Weaning strategy: Abrupt wean (AW, drop to 50% milk allowance, hold ten days, then wean) versus Gradual wean (GW, reduce milk allowance gradually over 10 days, then wean).

At 28 days post enrollment the weaning process was initiated with calves weaned at 38 days post enrollment. Calves were weighed 5 times between enrollment and one month post-weaning. Milk powder and grain intake at the pen level was measured weekly between enrollment and weaning. Treatment and mortality events were recorded by farm staff. Mixed linear and logistic regression was used to investigate the effect of milk allowance and weaning strategy on calf and pen level measures of growth, health, feed intake, feed efficiency and feed costs. Data from 38 pens (749 calves) were used in the final analysis (HM/AW = 10pens; HM/GW = 10 pens; MM/AW = 9 pens; MM/GW = 9 pens).

Results

Calf level growth and health measures. Weaning strategy had no effect on any outcome and won't be discussed further. Calves fed HM gained more weight and were heavier at weaning (wt = 60 kg; ADG = 0.54kg/day) as compared to MM calves (wt = 58.6 kg; ADG = 0.51 kg). However, there was no difference in weight gain during the one month period following weaning (HM = 81.4 kg, ADG = 0.68kg/day; MM = 79.8 kg, ADG = 0.67 kg/day). There was no effect of milk feeding rate on health measures in either the pre- or post-weaning period: Crude treatment rates and death loss from enrollment to one month post-weaning were 85% and 12.2%, respectively.

Pen level feed intake, feed efficiency and feed cost measures. Milk replacer intake was greater in HM pens (36.7 kg/calf) versus MM pens (32.7 kg/calf). During the period from enrollment to end of weaning, there was a non-significant tendency for HM pens to eat less total pellet (13.3 kg/calf) than for MM pens (14.4 kg/calf). Combining milk powder and starter pellet, HM pens ate more total dry feed (50.1 kg/calf) as compared to MM pens (47.0 kg/calf). Pen average feed:gain (F:G) ratios tended to be lower (better) for HM pens (1.75) as compared to MM pens (1.83) during the period from enrollment to initiating weaning. However, F:G ratios were higher (poorer feed efficiency) for HM pens (2.84) as compared to MM pens (2.27) during the active weaning phase. From enrollment to the end of weaning there was no effect of treatment on pen average feed:gain ratio (HM = 1.97; MM = 1.94). Feed costs between enrollment and weaning were higher for HM groups (\$128.45/calf; \$5.07/kg gain) as compared to MM groups (\$115.59/calf; \$4.77/kg gain).

Significance

Under the summertime conditions of this study, group housed Jersey calves fed 9 L of milk/day grew faster and were heavier at weaning than calves fed 7.5 L milk/day, but this feeding program cost more per calf and per kg of gain. Long-term follow-up will be necessary to determine if the higher milk feeding rate results in future improvements in animal performance. Weaning strategy did not affect animal performance or feed utilization measures.