Vacuum Levels and Cluster Weights

Danish workers recently published results of a study designed to look at the effects of vacuum levels and cluster weights on milk yield, teat condition and udder health. In 2 highline systems, milkline vacuum was set to either 38 or 48 kiloPascals (kPa: 100 kPa = 29.53 inches of mercury), resulting in short milk tube vacuums of 26 and 33 kPa, respectively. At each of these milking vacuum levels, pulsator vacuum was set either equal to milking vacuum or 8 kPa higher. Clusters weighed either 1.6 or 2.3 kg. In a lowline system, milkline vacuum was set at either 32 or 42 kPa with corresponding short milk tube vacuums of 30 and 39 kPa. Here is what they found:

Lower milkline vacuum (38 vs 48 or 32 vs 42 kPa) decreased average milk flow by 0.43 to 0.65 kg per minute, increasing average machine on-time by 2 to 2.5 minutes per cow. Peak milk flows fell from 2.8 down to 1.9 kg/minute in the highline systems and from 2.7 to 2.0 kg/minute in the lowline system. Average milk yield was reduced at low vacuum, primarily from higher producing cows with longer milking times. However, stripping yield (residual milk) was significantly higher at the higher vacuum levels. As expected, the higher short milk tube vacuum levels in the lowline system decreased average milking time by about 2 minutes/cow, compared with the highline systems. Audible liner slips increased by approximately 50% at lower vacuum. Neither decreased milkline vacuum nor increased pulsation vacuum (8 kPa above milkline level) had significant effects on teat condition or udder health.

Lower cluster weight reduced average machine on-time by 0.8 minutes/cow and reduced liner slips by more than 40% for the 2 highline systems. Cluster weight had no effect on total milk or stripping yields.

Based on their observations, the authors of this study recommend that mean vacuum in the short milk tube should not be lower than 32 kPa. Lower vacuum levels may result in reduced milk yields from slow milking, high producing cows. When average machine on-time for the slowest milking third of the herd exceeds 7 minutes for first lactation or 8 minutes for older cows, milk yield suppression can be expected.