

# Shiftwork on dairy farms: Worker health and safety considerations

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Most dairy farms, in order to maximize barn capacity, milk around the clock only to be interrupted by cleaning cycles and possible equipment malfunctions or inclement weather. Many dairy farms, especially those milking cows three times per day, operate 24-hours a day, 7 days per week. This around-the-clock schedule requires employees to work different shifts.

The worker safety and health challenge with regard to shiftwork is that of enabling the individual to work at abnormal hours, an activity that runs both counter to his or her own biology and counter to the surrounding society. Our society is structured to protect the sleep of day workers, but not that of night workers, and expects evening and weekends to be free for social, religious, athletic and cultural events. Some dairy workers cope well with shiftwork, others poorly.

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The fact that human beings are diurnal species and that some of the basic physiological functions associated with their performance capacities are subject to circadian rhythmic changes suggests that humans may not be suited for night work. Dairy owners and managers should appreciate that shiftwork coping ability among employees is the combined product of three factors: 1) circadian rhythm, 2) sleep and 3) social/domestic.

### **Circadian factors**

Adjustment to shiftwork is based on the circadian rhythm (meaning "about a day"). This 24-hour cycle of alertness and rest is regulated by a biological clock in the brain. As light enters the eyes, a tiny mass of nervous tissue is stimulated and its action suppresses the pineal gland that produces melatonin – a substance that causes the body to prepare for rest and is present at about 10 times higher amount at night than during the day.

When there is little light, melatonin is produced, which starts a cascade of chemicals that affect blood, glands, digestion, brain waves, body temperature and our general alertness and level of arousal. It can be extremely difficult to fight this physiological switch that induces rest and sleep.

When a person attempts to resist the physiological need for rest, the body can make its needs known even more clearly with signs of shift intolerance. An estimated 5-10 percent of the general population cannot tolerate nightshifts due to the intensity of intolerance symptoms. These problems can include headaches, persistent fatigue, gastrointestinal problems (diarrhea, constipation, upset stomach, appetite loss), muscular aches, restlessness and slowed reaction time.

### **Sleep factors**

Sleep is the major preoccupation of most shift-workers. In both Europe and the U.S., surveys have indicated that night workers get about 10 hours less sleep per week than their day-working counterparts. Sleep disorders can also occur, making it difficult during off duty to go to sleep, stay asleep, or experience a high quality of sleep. About 63 percent of night workers complain of sleep disturbance.

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This loss of sleep can become a "sleep debt" that robs a dairy worker of energy and alertness. Evidence of sleep deficit can be seen in as short a time as two days of inadequate sleep, and with as few hours of sleep loss. Significant sleep deficit can accumulate after more than three to four nights worked in a row, and some researchers believe that a schedule of six nights in a row may be too exhausting.

The psychological and behavioral effects of shiftwork can be equally troubling. Higher thinking skills are affected. When fatigued, memory and recall are slower, logical and arithmetic reasoning have more errors, decision-making is slower and report writing and comprehension are not as good. There is often a temptation to take shortcuts that can result in not following procedures and safety violations.

Emotionally, dairy workers who are fatigued may experience more frustration, irritability and aggression. Restlessness, nervousness and agitation can lead to impulsivity, carelessness and impatience. These reactions in turn make the work less satisfying and can lower morale, eventually contributing to higher absenteeism and turnover. These behavioral manifestations can also contribute to increased risk of injury to one's self or others.

### **Social and domestic factors**

Human beings are social creatures, and one could argue that social and domestic factors are at least as important in shiftwork as biological factors. If a dairy worker's domestic and social life is unsatisfactory, then the worker will not be coping satisfactorily.

In addition to disrupted family roles, the night shift-worker often suffers from social isolation from day-working friends and from religious, sporting and community organizations that work under the expectation that evenings or weekends will be free for meetings and activities.

The adjustment to shiftwork can also place many demands on the dairy worker. Family and social activities are out of phase with the diurnal world, and spouse and children may question whether the shift-working family member provides sufficient companionship, intimacy, support, sharing and protection.

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In addition, shopping, recreation, and socializing with friends are difficult to arrange at convenient times because of resting. Many fatigued dairy workers simply find it too difficult to do anything off duty other than eat and try to catch up on sleeping, and reserve other activities for days off.

Shift schedule design

Although there is no single work schedule that is optimal for all tasks, many industries have moved from three eight-hour shifts over several weeks, to two 12-hour shifts over about four days. Moving from 8-12 hours does not seem to significantly interfere with performance, but four days is about the limit of doing night work without making circadian changes.

Studies examining such schedules have reported few ill effects and several improvements: increased productivity, higher morale, lessened fatigue, better time blocks for free time, improved family relations, reduced commuting, improved health and more job satisfaction.

Nonetheless, it is not possible at this time to recommend that all dairy farms convert to such a schedule. It is more advisable to design a schedule that fits the demands, risks and personal needs of each dairy operation.

Additionally, it is important to make sure the nightshift feels that management values as much about their performance as dayshift workers. Often, nightshift workers complain about the lack of interest from management, which can negatively impact their motivation and performance.

Shiftwork has become a necessity on modern dairy farms. Dairy owners and managers should understand and appreciate the impact of shiftwork on the body clock, which can produce adverse physiological, psychological and behavioral problems that interfere with job performance and satisfaction. Family and social involvement can also suffer.

Many of these effects can be prevented or reduced by an integrated effort on the part of the dairy farm and worker to develop countermeasures to shift fatigue. These include designing effective shift schedules, orientation and education for the worker, promoting healthy diet and exercise, and developing skills in sleep preparation and stress coping. **PD**

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