

veyed practiced on cow-calf operations and 77% practiced on dairy farms, graduating veterinarians should be trained in all of the aforementioned procedures.

The 11 (20%) lowest-frequency rankings among surgical and anesthetic procedures were for cryosurgery (0.6 ±1.0), ovariectomy (0.6±1.1), repair of penile or preputial defects (0.5±0.7), intestinal resection and anastomosis (0.5±0.6), tracheotomy or tracheostomy (0.4±0.6), tracheal intubation (0.4±0.8), liver

biopsy (0.4±0.7), fracture repair by means other than casting (0.4±0.7), repair of urovagina (0.4±0.6), inhalation anesthesia (0.3±0.8), and pelvic symphysiotomy (0.2±0.5). Ten of these procedures also received the lowest-proficiency rankings (range, 1.8±1.0 to 1.1±1.0). Procedures with low overall scores should be de-emphasized in veterinary (bovine) curricula, with emphasis placed on surgical and anesthetic procedures that are performed frequently.

## Observations of Dairy Cattle Behavior Using Time-lapse Photography in a California Free-Stall Barn

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### Introduction

Resting is a fundamental physical need of dairy cattle, and any improvement in stall comfort and resting time may result in improved milk production and decreased incidence of lameness. However, assessing housing facilities for cow comfort potential has proven difficult. To assess free stall utilization and other behaviors, dairy consultants count cows lying, eating or standing. Results are often confusing because of such possible confounding variables as time of feed delivery, milking times, or ambient temperature. This study documented dairy cow behavioral patterns using time-lapse photography at a free stall dairy in the central San Joaquin Valley of California to determine the optimum time for visual assessment of free stall usage during hot summer conditions.

### Materials and Methods

Four video cameras were evenly spaced in the free stall barn housing the high-producing cows on one dairy farm. Lactating cows on this farm had no access to pasture or exercise lots. Cameras were linked to a centrally located monitor and video recorder. The monitor displayed a different camera's view every 20 seconds in a sequential, repeating cycle. Every 3 seconds, an image was recorded on film. The videos, recorded over a 7-day period in July 1999, were reviewed and hourly images captured on screen (Snappy® Video Snapshot, Play Incorporated) to improve accuracy of the counts.

Cows were counted as lying, standing or eating in each of the four sections of the pen. "Proportion lying" was defined as total number lying in a free stall, divided by the total number not eating or drinking. Temperature probes (Optic StowAway® Temp, Onset Computer Corporation) were strategically placed throughout the feedbunk, free stalls, both ends of the pen, and at an outside location to record temperatures every 10 minutes. Other variables such as feeding times, milking times, times of heat detection, and times of feed push-up were also recorded. Correlations between proportion lying and ambient temperature, feeding time, and milking time were examined.

### Results and Conclusions

Cattle showed a statistically significant ( $P < 0.05$ ) pattern of temporal periodicity in their lying behavior when analyzed using an adaptation of the Friedman two-way analysis of ranks test. Highest average proportion of cows lying was seen at 6 am (77%) and minimum proportion lying occurred at 1 pm (23%).

There was little difference in recorded temperatures between feed bunks and free stalls, but larger differences in temperature extremes existed between the two ends of the pen (28-44°F difference). Average outside temperature varied from 58°F to 91°F, while temperatures recorded within the pen varied from 58°F to 86°F.

Cattle behavior displayed distinct spatial patterns in response to time of day, temperature, and sun exposure of feed bunks and free stalls. One section of the

pen was avoided during late morning hours due to sun exposure, and another section displayed a clustering of cows during the late afternoon hours.

Time-lapse video equipment proved beneficial in observing cow behavior over extended periods of time.

Factors such as temperature, time elapsed since milking, and time elapsed since feeding all impacted the proportion of cows observed lying. Recognizing and addressing cow behavioral patterns should lead to better facility design and improved cow comfort.

## Milk-flow Disorders: Diagnosis of 133 Cases Using Theloscopy

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### Abstract

This study reviewed 133 cases of milk flow disorders in dairy cows that were diagnosed by using teat endoscopy (theloscopy). Theloscopy was performed via teat canal (axial theloscopy) or via the lateral teat wall (lateral theloscopy). Study subjects were predominantly young Brown Swiss cows housed in tie-stall facilities. Most subjects were presented to the Veterinary Clinic

Babenhausen/Germany during the first month in milk, and most were pre-treated. Hind teats most frequently were acutely affected by milk-flow disorders. Reasons for milk-flow disorders included ruptures in the area of the teat canal (with or without inversion of tissue into the teat canal), as well as foreign bodies and septa in the teat cistern. Theloscopy is a useful means for diagnosis of milk-flow disorders in dairy cows.

## Evaluation of the California Mastitis Test for Screening Dairy Cows for Intramammary Infection at Calving

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### Introduction

Udder health management programs at dry-off and during the dry period are essential to control and prevention of mastitis in dairy cattle. Knowledge of the prevalence of subclinical intramammary infection sta-

tus at calving, and the specific pathogens involved, allows producers to evaluate effectiveness of these udder health programs. However, milk sampling and culturing all cows at the time of calving can be expensive and time consuming, and has not been widely adopted by the industry. California mastitis test (CMT) has not