We evaluated stallion sexual vocalizations with and without olfactory stallion stimuli as an aid to estrus detection in mares. Eleven horse mares were exposed to either auditory or auditory with added olfactory stimuli on a Monday-Wednesday-Friday (M-W-F) schedule for detection of estrus. A contextually congruent three-minute soundtrack of stallion vocalizations was presented to mares at rest in stalls simulating a live stallion approaching from out of view. Preputial smegma samples obtained from the same stallion were diffused into the mare’s stall as olfactory stimulus. Frequency as well as latency to the first occurrence for each of six specific receptive and six non-receptive responses were recorded from video recordings of the trials. Additionally, an overall determination of estrus, diestrus, or ambivalent behavior was made. Confirmation of ovarian status was based on records of daily transrectal palpation and ultrasound, along with RIA serum progesterone levels. During the four week study period, for 12 of 15 ovulations, estrus was detected with the M-W-F auditory and olfactory protocol, within zero to 10 days before ovulation (mean 4.4 d, SD 2.7). For 8 of 9 occasions for which study protocol and live stallion estrus detection results were discrepant, results with auditory and olfactory stimuli were more consistent with ovarian status. We conclude that auditory stimuli in the form of recorded stallion vocalizations presented to mares in a contextually congruent manner were at least as effective as a live stallion and in some instances more accurate. Further, the addition of olfactory stimuli increased the intensity of estrus response elicited.

**Key words:** Estrus detection, mare, vocalizations, olfactory, auditory, stallion