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The welfare of working dogs in cars

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Working dogs, such as police dogs, spend a large amount of their time in cars. It has been hypothesized that a smaller cage could be safer for the dog during driving, especially at high speed, but that a larger cage could allow better comfort (e.g. for resting) when the car is parked. This presents a conflict. Our study investigated how dogs in a car are affected by cage size. Working dogs of the breeds German Shephard ($n=8$) and Springer Spaniel ($n=8$) from the Swedish Police and Customs were tested in four different cage sizes in four different car treatments; parked, slow cruising, normal driving and fast emergency driving. The study was conducted at a test track. Each dog was tested in all combinations of cage and driving style over a two-day period. Each combination involved 30 minutes in the car, except for the fastest driving style that was shortened to 5 minutes. The behaviour of the dogs was recorded by two video cameras in the car and the dog's heart rate and variability were recorded using a monitor (Polar V800). Statistical analyses used a mixed model or a Friedman test followed by a Wilcoxon Signed Rank test. Driving style had the largest effect on the dogs. The faster the driving, the higher the heart rate ($P<0.001$) and the lower the RMSSD values ($P<0.001$). Faster driving also resulted in a higher prevalence ($P<0.01$) of behavioural stress indicators (e.g. lip-licking, panting, shaking). No cage size seemed to be better regarding safety, such as decreasing the prevalence of slipping, losing balance or bumping against the walls of the cage. These behaviours occurred frequently, around 50% of the time, in the fastest driving style. Regarding comfort, the cage that was shorter than the length of the dog (although not the smallest in area), resulted in least time lying down during parking and slow driving ($P<0.05$) (on average 59% of the time) compared to the other cage sizes (on average 78% of the time lying down). Dogs also had a tendency to stretch more (3.75 times more), after spending 30 minutes in this cage ($P=0.058$). The largest cage, proportional to the size of the dogs, resulted in 2.6 times more changes in body postures ($P<0.05$). In conclusion, faster driving, including turns and sudden brakes, appears to be physically demanding and experienced negatively by dogs, irrespective of cage size. However, cage dimension still seems to matter regarding comfort. Transporting a dog in a cage shorter than its length, as measured from nose tip to point of buttock (currently allowed in the Swedish legislation for working dogs) could, due to worse comfort, negatively affect the performance of the dog when taken out of the car.