

# Maternal Stress and Puppy Development

Maternal stress in the prenatal period of puppy development can have a lifelong impact in the physical and behavioral health of the puppy.



## IT IS IMPORTANT TO AVOID OR REDUCE MATERNAL STRESS.

Stress triggers the release of hormones such as cortisol into the bloodstream. When these hormones cross the placenta from mother to pups, it changes the set point of the puppies' stress response system. Stress also alters the quality of maternal care, which affects later behavior of the puppies. As adults, these puppies are likely to be more fearful and anxious, and may react more strongly to stressful experiences.

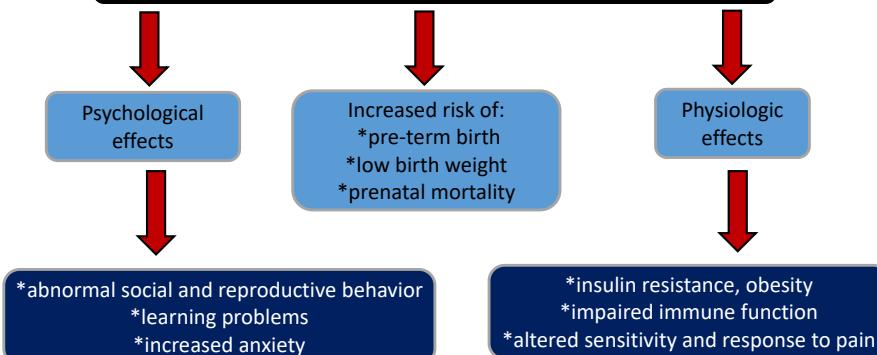
### DID YOU KNOW?

A dog's preference for certain smells or tastes begins to develop before birth. At the time of weaning, puppies will prefer flavors associated with the diet fed to their mother during pregnancy and lactation. Maintaining a **consistent**, high-quality diet throughout late pregnancy, lactation, and weaning will decrease maternal stress and promote an easier transition to solid food for puppies.

## HOW CAN I REDUCE MATERNAL STRESS?

- Genetic Selection: Avoid breeding dogs that are highly reactive. Temperament traits are inherited from both parents, so choose your breeding animals wisely.
- Give frequent, positive human contact. Use low-stress handling techniques such as stroking, brushing, or offering food treats.
- Provide exercise, such as leash walks or time in a play yard, daily.
- Offer daily enrichment. Toys, chew items, music, and other sensory stimuli (novel smells or tastes) are a few options for mental stimulation and stress relief in dogs.
- Avoid grooming, dental procedures, and preventive care such as vaccines during pregnancy.
- Design whelping and nursery areas to minimize noise and social stress from unfamiliar dogs housed nearby.
- Maintain your dog's housing at a proper temperature and humidity level for comfort and good air quality.

### Maternal stress in the prenatal period is associated with:



This Animal Care Aid is part of a series developed to provide information about behavioral development in dogs. Refer to the other topics in the series for more information on socialization and the early-rearing environment.

Questions? Email us at [CenterforAnimalWelfare@usda.gov](mailto:CenterforAnimalWelfare@usda.gov)

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