Proceedings of the 8th International Symposium on Canine and Feline Reproduction

ISCFR

June 22-25, 2016

Paris, France

In a joint meeting with the XIX EVSSAR Congress

Reprinted in IVIS with the permission of the ISCFR Organizers
Factors affecting neonatal bodyweight and growth rate in Great Dane puppies
Monica Melandri\textsuperscript{a}, Salvatore Alonge\textsuperscript{a}, Maria Cristina Veronesib\textsuperscript{b}
\textsuperscript{a}Società Veterinaria “Il Melograno” SRL, Sesto Calende (VA), Italy;  
\textsuperscript{b}Dipartimento di Scienze Veterinarie e Sanità Pubblica, Università degli Studi di Milano, Milano (MI), Italy.
salvatore.alonge@tin.it

In puppies, a physiological weight loss (<10\%) in the first 24-48 h of age is reported; then double bodyweight should be recorded by 10 days after birth\textsuperscript{1}. Neonatal bodyweight (NBW) at birth and neonatal weight gain (NWG) vary in dogs of different size as among breeds of similar size\textsuperscript{2}. Among several factors, also maternal and paternal bodyweight (MBW and PBW, respectively), litter size (LS), genetics, and neonatal gender (NG) might influence NBW, and growth rate. Breed-specific reference values for NBW and NWG are helpful for the correct management of normal newborns and for the prompt recognition of puppies underweighted at birth or that fail to grow. The aims of this study were: 1) to depict NBW and NWG curves of Great Dane puppies; 2) to investigate factors influencing NBW and NWG in this breed. Eight bitches of a single FCI kennel (BCS of 2.5-3/5) were enrolled in this study. The MBW, PBW and BCS were assessed at breeding. All bitches were fed with the same commercial diet according to metabolic requirements for gestation and lactation. At whelping, NBW of 108 puppies (18 litters) measured before the first suckling, LS and NG were recorded. All puppies were fed exclusively by maternal milk assumption. The NBW was daily (evening) monitored for the following 3 weeks of age. The effect of MBW, PBW, LS and NG on both NBW and NWG was evaluated. All data were statistically analyzed by Student T Test and ANCOVA (p<0.05). The MBW was 60.4±4.69 kg, the PBW was 71.7±4.30 kg. All puppies were born at term of normal pregnancies. At whelping, litter size was 6.0±3.16 (mean±SD) and NBW was 620.9±94.04 g (mean±SD), with a ratio of 1.04% and 0.87\% compared to MBW and PBW, respectively. The NBW was positively influenced by MBW, PBW and negatively influenced by litter size and female gender (p<0.01). A daily NBW curve was drawn plotting body weight and age (days): the exponential trend line resulted in $y = 606.28e^{0.0523x}$ ($R^2=0.99$). No significant weight loss was detected in the first 48 hours of age; a constant trend line of growth (p<0.0001) was instead observed from birth to the end of the study, with a daily increase of 5.42±1.72\% (mean±SD). The NWG was positively influenced only by PBW (p<0.01) and negatively affected by LS and female gender (p<0.01). A weekly growth rate curve was built comparing growth rate and age (weeks): the exponential trend line resulted in $y=1.0544e^{0.0479x}$ ($R^2=1$). In puppies of 3 weeks of age, NBW was 2.00±0.60 kg (mean±SD), with a ratio of 3.23\% and 2.72\% compared to MBW and PBW, respectively. Present results confirm that growth rate is slower in giant than in smaller dogs\textsuperscript{3}, even in healthy puppies. The breed-specific Great Dane NBW and NWG curves defined in this study might be helpful in clinical practice to estimate the healthy growth of puppies. The positive influence of PBW, already reported in other species, such as cattle\textsuperscript{4}, and the negative effect of the female gender on both NBW and NWG in Great Dane puppies might be explained by a possible sexual dimorphism between male and female puppies expressed already at birth by a different bodyweight.