

## Interest of early energy supplementation in puppies to control the risk of neonatal mortality

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Neonatal mortality, from birth to 3 weeks of age, affects 15 to 25% of newborn puppies<sup>1</sup>. Energy intake may be one of the factors limiting their survival since puppies with weight loss over the two first days of life below 4% are at greater risk of mortality<sup>1</sup>. The aim of this study was to evaluate the impact of an early supplementation with a milk replacer enriched with a glucose polymer (maltodextrin) on puppies' growth and metabolism up to 48 hours of age. The experiment was carried out within a multibreed kennel on 271 puppies born from 56 bitches. At 12 hours of age, puppies were identified, their sex and breed were recorded, and puppies were classified into small, medium and large breed dogs and then, within each litter, allocated into two groups (supplemented or controls) depending on their birth weight. Both groups were suckling their mother freely from birth, but one group was supplemented with a milk replacer (Baby dog milk®, Royal Canin) enriched in maltodextrin (33% proteins; 34% fat; 27% carbohydrates; 6.1 kcal/g of milk powder) whereas nothing was given to the control group. Supplementation was administrated at the dose of 1.5ml per 100g of birth weight using a feeding tube every 6 hours from 12 to 48 hours of age. At 12, 24, 48 hours, puppies were weighed and their rectal temperature and blood glycemia (using disposable test strips and portable device) were measured. Multivariable statistical analyses, with litter as a random term (LME procedure), were used to examine the impact of the energy supplementation on glucose, temperature and growth rate in puppies. Proportion of supplemented or control puppies at risk of mortality (growth rate between D0 and D2 < -4%<sup>1</sup>) was analysed with the Chi square test. Data are presented as mean ± SD. Puppies belonged to 16 breeds (46.3% from small, 16.7% from medium, 37.0% from large breeds). Among the included puppies, 49.4% (134/271) were supplemented. Ten out of 271 puppies died between 12 and 48h after birth (4 controls and 6 supplemented). At 12h of age, there was no significant differences between the supplemented and control groups in weight (288±120g vs 292±123g; p=0.12), glycemia (115±37mg/dL vs 117±40mg/d; p=0.74), or temperature (36.0±1.1°C vs 36.1±1.1°C; p=0.82). The supplemented and control groups had a mean glycemia of 127±42mg/dL vs 121±41mg/dL at 24h (p=0.14), and 111±33mg/dL vs 110±39mg/dL at 48h (p=0.40). The mean temperature was not different between groups at 24h: 36.8±1.0°C vs 36.7±1.0°C (p=0.12), but it was significantly increased in supplemented vs control puppies at 48h: 36.7±0.9°C vs 36.4±1.3°C (p=0.03). The supplemented group had a significantly higher growth rate than the controls (12-24h of life: 1.1±9.5% vs -0.12±4.3%; 12h-48h of life: 7.2±7.8% vs 2.9±10.7%; p<0.001 in both tests). The supplementation significantly decreased the number of puppies at risk of mortality, according to their growth rate: 28.4% (38/134) for the control group vs 16.2% (21/130) for the supplemented group (p=0.02). This study showed the interest of a systematic energy supplementation through milk replacer administrated immediately after birth on puppies' early growth rate and body temperature maintenance. It demonstrates also that early energy supplementation reduces the number of puppies at risk of neonatal mortality (growth rate 0-2 days < -4%).

<sup>[1]</sup> Mila H, Grellet A, Feugier A, et al. Differential impact of birth weight and early growth on neonatal mortality in puppies. J Anim Sci. 2015;93:4436-4442



# ABSTRACT BOOK

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